A SEMANTIC ACCOUNT OF QUASI-LEXEMES IN MODERN ENGLISH – PROCESSING SEMIOTIC UNITS OF GREEK OR LATIN ORIGIN INTO LEXICAL UNITS

BY

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A Semantic Account of Quasi-Lexemes in Modern English

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Processing Semiotic Units of Greek or Latin Origin into Lexical Units

Chris Souillé-Rigaut

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à Jean Tournier

Hygroneiric, adj. [Greek *ὑγρός* ‘wet’ and *ὄνειρος* ‘dream’]

If a puerifugal nurse reclines with an elderly patient, and he has a wet dream, does that make her a wet nurse?

OUTLINE

INTRODUCTION

Method of lexicological analysis

In their paper 'Integrating Neoclassical Combining Forms into a Lexeme-Based Morphology', Dany Amiot and Georgette Dal point out that in Greek[1] or Latin, combining forms were usually 'lexemes with grammatical words associated'; whereas, in their borrowing languages, they can only 'appear as bound constituents of lexemes, without receiving associated grammatical words' (p.323). From a diachronic perspective, we notice that these elements of Greek or Latin have provided English, as well as other modern languages, with an opportunity to add to their lexicon a set of scholarly words in the scientific and technical fields. According to the Oxford English Dictionary, the word 'homicide' entered the English lexicon c1375 via French, which had been using it since the 12th century. In Latin, 'homicide' has a case inflection associated with the lexical unit ('*... ad homicid**ium** pertinere*[2] *...*' Saint Augustine), but in the borrowing languages, the case inflection was dropped, and the lexical unit became a fragment of a lexeme. Subsequently, other composites with the element -cide were borrowed, either directly from Latin or Greek or indirectly via French: fratricide (c1450), parricide (c1545), regicide (1548), matricide (1594), etc. To make up for the loss of case inflection, these composites began to merge with the vernacular lexicon of English by undergoing derivation across the major lexical categories. 'Homicide' became verbalized by functional shift in 'homicide' (c1470); it became adjectivized by suffixation in 'homicidious' (1632), 'homicidal' (1725) and 'homicidial' (1808). In addition to this, semantic changes occurred within lexical categories. In the aforementioned examples with -cide, each of them was at first used as an agent, and then as the action of killing. However, 'homicide' stands as the prototype of all the composites in -cide in Latin and, interestingly, we will examine how the borrowing languages over time have reapplied this prototypical rule to make up their own neoclassical composites (e.g. apricide) or hybrid composites (e.g. poultrycide). Laurie Bauer (1998) mentions that these neoclassical composites 'are not classical words, but are formed in English according to the principles of classical languages' (p.404). At this point, how to draw the line between a classical composite and a neoclassical composite is questionable. Latin and Greek have been continuously contributing to enlarge the lexicon of modern languages; therefore, classical and neoclassical composites form a continuum rather than forming discreet categories. As to whether these composites belong to their original language or are assimilated in the borrowing languages also needs consideration. It is clear that in their original language, they functioned as lexemes; whereas, in the borrowing languages, they are merely protolexical elements onto which other elements have to be attached. This creates difficulty for lexicologists, who have to determine to what morphemic category[3] these protolexical elements belong.

The question that is raised by Bauer in the title of his article 'Is there a class of neoclassical compounds, and if so is it productive?' will represent the first part of my analysis. However, my approach will be of a somewhat different nature; the method I am proposing to follow consists in separating combining forms from other morphemic categories by enhancing their specificity and heterogeneity. I will then review the concept

and process of compounding and apply its theories to composites with combining forms. I will prove that, as a separate and heterogeneous morphemic category, their integration into the lexicon is incomplete, and that their participation in the process of compounding is more limited than that of complete lexemes. I will also tackle the distinct semantic features that prevent them from being integrated, as complete lexemes are. Beyond these restrictions, I will demonstrate how combining forms that are realized as foreign compounds tend to be in complementary distribution with native compounds. I will give further evidence that, in spite of their specific semantic pattern, they have not become a closed set of elements, but lend themselves to lexical productivity. A lexicographical analysis, with comparisons between different editions of the same dictionary, will support my argument for continuous dynamic development.

Method of lexicographical analysis

The labeling of unbound lexemes has been an uninterrupted problem over many decades. Tvrtko Prćić (2005) claims that current labeling is 'inconsistent and confusing' (p.314), and that contradiction is commonplace in this area. There are actually three major problems that are being raised:

- Combining forms and affixes are commonly confounded, as well as combining forms and other fragments of lexemes.

Jean Tournier (1985) points out that even the most illustrious dictionaries have been confounding affixes with combining forms. These elements are essentially intensifiers, whether they are augmentative and diminutive (e.g. macro-, mega-, giga-, mini-, micro-, etc.); multipliers and divisors (e.g. kilo-, deci-, milli-, etc.); or numerals (e.g. tetra-, penta-, etc.). Other constituents that have the potential to occur either in the initial or final position may also be affected. For example, the Concise Oxford Dictionary classifies octo- as a combining form but nano- as a prefix. The elements bi- and hemi- are labeled prefixes in the 5th, 6th and 7th editions and combining forms in the 8th, 9th, 10th and 11th editions. Likewise, phono- is classified as a combining form, whereas -phone is classified as a suffix. Such random labeling can make it difficult to select combining forms from a dictionary on the basis of their classification.

- The morphology of combining forms is inconsistent and shows a lack of etymological knowledge.

Prćić indicates that the second edition of the Oxford English Dictionary has two entries that are cross-referred: -logy and -ology. We will see that neither of these combining forms is a legitimate entry form, as they bear one and two affixes, respectively. The correct entry form should be -log-. As for Prćić's position of considering the interfixes -o- in Greek and -i- in Latin to be parts of their initial combining forms, I esteem that this is quite hazardous, based on etymic evidence, and I advocate a more accountable and objective perspective instead, namely, the 'theory of

interfixation' whereby each combining form would have a single entry form, whether this combining form is initial, final, or both.

Another aspect of etymic confusion concerns an element like heli-, which is labeled a combining form in the Oxford English Dictionary, when it is actually a truncated form of the combining form -helic- from Greek *ἕλιξ, ἕλικος* 'spiral'. Heli- is not a splinter either, but an element of a blend, and it lends itself to blending with other constituents (e.g. heli[copter] + [air]port > heliport). It has a semantic function but no etymic foundation.

Unfortunately, lexicographers are not meticulous enough when choosing their entry forms, and that makes their classification somewhat erratic.

- A few combining forms are lexicalized as composites, that is to say, they are concatenated with other bound or unbound lexemes, but they have no entry form of their own.

As I started collecting combining forms from dictionaries, it came to my attention that a few composites had no entry form for their individual elements. An example is 'helobious' from Greek *ἕλος, ἕλεος* 'marsh' and *βίος* 'life'. It is clearly defined as 'living in marshes'. However, there is no entry form -hel-, nor is there, other than bio-, an entry form that would indicate the potential for the combining form derived from *βίος* to occur in the final position as well. Another peculiar example is 'hemeralopia' from Greek *ἡμέρα* 'day' and *ἀλώψ, ἀλόπός* 'blindness', which contrasts with 'nyctalopia'. The latter finds its entry form as a combining form nycto- but the former is absent as -hemer-. This lack of lexicalized entry forms for individual combining forms has made my task of collecting data more arduous than planned, as I had to look not only for combining forms, but also for composites made with combining forms.

Hereafter, in order to avoid any confusion as to what combining forms are and how they differ both from other fragmented elements and from complete lexemes, I will refer to them as 'quasi-lexemes', and I will subsequently provide evidence for their heterogeneous character. In fact, previous analyses of quasi-lexemes have been contradictory as to whether they should be assimilated with affixes or with lexemes, and as we just observed, lexicographical criteria, in that respect, have proved inconsistent. In my research, the chief purpose of dictionaries will be to verify the lexicalization of each quasi-lexeme found as an entry form or in a composite, as well as its origin and date of first occurrence. In order to lend support to my approach, I will make use of some 978 quasi-lexemes[4] I have compiled over the years from three major dictionaries which, despite their inconsistencies, have the merit of offering a solid sample of quasi-lexemes: the Oxford English Dictionary (OED), the American Heritage Dictionary (AHD), and the Webster's Third New International Dictionary (W3). There is no standardized set of nomenclature in these general dictionaries, which have integrated non-technical quasi-lexemes and occasionally technical ones. My method of selection of quasi-lexemes will be based upon whether or not two out of three dictionaries have integrated the quasi-lexeme. If the quasi-lexeme is not present in at least two dictionaries as an individual element or in a composite, it will be ruled out. This method is intended to make the selection as large as possible, while preventing a possible error due to the one dictionary. Following the same procedure, technical quasi-lexemes that are lexicalized in these

dictionaries will be selected, but those that are not lexicalized in at least two dictionaries will be ruled out, for the sake of data limitation. It will be interesting to observe, from a semasiological perspective, how the integrated technical quasi-lexemes are formed and if they follow the same semantic pattern as non-technical ones. Semasiology suggests that, rather than approaching quasi-lexemes inductively, the purpose of having a large data set is to be able to perform a deductive analysis. In that way, we should be equipped to discern more accurately the category (or categories) to which these elements belong, and how they may differ from other categories of lexemes in the process of word formation.

PART I. QUASI-LEXEMES: BOUND LEXICAL ELEMENTS

A. Defining quasi-lexemes

Peter Matthews (1974) defines the lexeme as being a member of the major lexical categories of noun, verb, or adjective with a constant and entirely specified meaning. Quasi-lexemes, commonly referred to as 'combining forms' are similar in that respect. According to Valerie Adams (2001), they derive from Latin and Greek adjectives, verbs, or nouns, as opposed to prefixes, which usually derive from prepositions or adverbs. The hypothesis according to which quasi-lexemes are strictly affixes would have no other criterion than their boundness. However, their semantic content proves otherwise. As for Lionel Guierre (1979), he asserts that although they share common features with complete lexemes, quasi-lexemes are different because of formal, distributional, and segmental properties. This leaves us with two significant approaches in determining to what morphemic category quasi-lexemes belong. The first approach is that they are either affixes or lexemes depending on their meaning. This is a perspective adopted by Danielle Corbin (2001) among others. The second approach is that they are neither affixes nor lexemes. Beatrice Warren (1990) maintains that they are irreducible to the already established categories of word formation. These two approaches have the merit of considering quasi-lexemes as being elements that are outside of the norm.

When differentiating affixes from lexemes, Amiot and Dal assert that affixes, to which they refer in a broad sense as exponents of LCRs (exponents of 'Lexeme Construction Rules'), are 'the result of the application of a rule to lexemes', as opposed to lexemes being 'the concatenation of morphemes' (p.328). Bernard Fradin and Françoise Kerleroux (2009) define the lexeme in relation to the affix as follows: 'We call lexeme […] a linguistic entity onto which exponents of LCRs are attached' (p.84)[5]. If we look at quasi-lexemes, we observe that they preferably concatenate with each other (e.g. -hom- + -cid- > **hom**i**cid**e), but not necessarily (e.g. **phon**ic, **cran**ial). Yet they are bound elements, which entails two principles: they have a semantic content similar to complete lexemes belonging to the categories of noun, verb, or adjective, and they need at least one affix to form a complete lexeme. We will subsequently address the cases of linguistic '**morph**' and mathematical '**graph**', which seem to contradict the law of affix requirement but actually do not, since these lexemes should be analyzed diachronically as examples of apocope.

B. Contrasting quasi-lexemes with other bound lexical elements

Although various contemporary morphologists have extended the category of quasi-lexemes to fracto-lexemes, truncated elements, elements of blends, paleo-lexemes, or whatever fragment of a word that is used in combination with another, I will restrict my analysis to the category of bound classical or neoclassical elements and provide evidence for their contrast with other fragmented elements and also with unbound lexemes.

1. Quasi-lexemes versus affixes

In his categorial analysis, Prćić attempts to compare initial quasi-lexemes with prefixes. We will find out that the statements he makes could be generally applied to final quasi-lexemes and suffixes as well. Therefore, I will take the liberty of extending his results to all quasi-lexemes and affixes where applicable.

As Prćić explains, the similarities between quasi-lexemes and affixes are threefold: both of them are bound elements with identifiable form, content, and function; they are not viable by themselves; and they form outputs of binary structures. Although we would think of a secondary compound like 'ethnoarchaeology' as having a ternary structure, let us consider that, from a strictly synchronic point of view, the constituent -ethn- concatenates with the lexeme 'archaeology' to form an output with a binary structure.

As for the differences between quasi-lexemes and affixes, Prćić asserts that affixes are a closed set of elements[6], they have no distinctive form, and no affix concatenation is allowed by rule. Quasi-lexemes are an open set of elements, they prototypically end in a vowel, and they concatenate with each other and with lexemes. Overall, the differences between quasi-lexemes and affixes, he postulates, are greater than their similarities.

The fundamental statement I will make about quasi-lexemes is that they combine preferably but not necessarily with each other. Affixes do not have this property, at least in the general lexicon. Tournier (1985) points out that there are highly technical terms of organic chemistry that are made up solely of affixes. However, the issue that I am about to raise concerning quasi-lexemes and the transitional stages that sometimes lead them to become affixes could apply in reverse to affixes turning into lexemes or fragments of lexemes.

Traditional linguistics claims that quasi-lexemes, when combined with other quasi-lexemes, can occur in the initial position (e.g. -micr- in 'a**micr**obic' from Greek *μικρός* 'small') or final position (e.g. -cid- in 'geno**cid**al' from Latin *caedere* 'to kill'). There are quasi-lexemes that have the potential to occur either in the initial or final position (e.g. -graph- in '**graph**ology' or 'steno**graph**y' from Greek *γράφειν* 'to write'). To that claim, Tournier has added that in order to be called quasi-lexemes, elements like -micr- or -cid- should have the potential, whether they are realized or not, to occur in the initial or final position. If not, they would be restricted to the category of affix.

Amiot and Dal have provided a fresh perspective on the issue of initial or final position by discerning several varieties of quasi-lexemes. They have analyzed four quasi-lexemes in French to illustrate the different prototypes we can expect to find. I would like to summarize the result of their research:

- ***Lud-*** is a quasi-lexeme that is used initially to form a complete lexeme (e.g. **lud**ible, **lud**ology, etc.). In French, it is in complementary distribution with the lexeme *jeu*, which may, in turn, be used finally when derived (e.g. *inter**jeu***, *contre-**jeu***, etc.). Further on, they assert that lud- and *jeu* are indeed the same lexeme with different 'graphemic and phonological forms'.

- ***-anthrop-***, as a quasi-lexeme of Greek origin, is in complementary distribution, not with a vernacular French lexeme, but with its Latin counterpart -homin-. The former 'appears in a wide variety of fields such as geography and anthropology in conjunction with constituents of Greek origin'. The latter 'tends to be used in biology and zoology in conjunction with constituents of Latin origin' (Amiot & Dal, p.330).

- ***Micro-*** was originally restricted to the status of quasi-lexeme, but it has undergone a process of grammaticalization[7] so that it has become an exponent of an LCR (or, in other words, an affix) as well. Etymologically, the Greek element used to mean 'small' (e.g. **micr**obe), but with time, it changed into a prefix of measurement with a value of a millionth of the unit denoted by the second constituent (e.g. **micr**osecond).

- ***-log-*** is a quasi-lexeme that has undergone a metasemous transfer from 'speech' to 'specialist' to the extent that it can be used initially or finally in its literal meaning (e.g. **log**omachy, miso**log**ue, etc.), but it can only be used finally in its derived meaning (psycho**log**ist).

This analysis provides an interesting perspective, which allows me to argue the precariousness of a single category of quasi-lexeme. In addition to being borrowed from classical languages with specific features, quasi-lexemes undergo metasemous changes, which not only extend their meaning, but also their distributive range.

As far as the presentation and description of these prototypes of quasi-lexemes are concerned, I would like to propose a more consistent lexicographical standard that will, at the same time, enhance the contrast between them and affixes. When referring to quasi-lexemes, it is advisable to use hyphens on each side of the constituent (e.g. -lud-, -anthrop-, -micr-, -log-). One may argue that the quasi-lexeme is used strictly in the initial or final position; however, it is always possible for a quasi-lexeme to be prefixed or suffixed, as the examples 'a**micr**obic' or 'pre**lud**ial' testify. This will not make a clear contrast with affixes, some of which are always terminal[8] (e.g. -ness, -ity, etc.), while others are not (e.g. -dys-, -ical-, -arian-, etc.). The complexity of word formation does not even allow us to postulate that a non-terminal prefix like -par- in '**par**aesthesia', may only be bound to additional prefixes in a derivational chain. The example 'acro**par**aesthesia' shows us that not only is -par- non-terminal, but it can be anchored between quasi-lexemes[9]. I still maintain that a prefix, for lack of having a fixed position, is bound to the left of a given lexeme or fragment of a lexeme, and a suffix is bound to the right of that constituent, regardless of the further processes of derivation they will undergo.

Another feature related to quasi-lexemes is the presence of the interfixes -o- in 'anthrop**o**metry' and -i- in 'alb**i**florous'[10]. For lexicographical convenience, I would like briefly to address the popular disagreement on whether this interfix is attached to the first constituent, attached to the second constituent, or added as a linking element between the two. Admittedly, this question partakes of phonological regulations more than semantic principles. However, based on the speculation that this interfix belongs to the first constituent, one deduces that the elision of this interfix occurs invariably between quasi-lexemes under phonotactic constraints (e.g. **micr**androus) but generally not between a prefix and a quasi-lexeme under the same constraints (e.g. ant**e**aural). In that respect, the

composite '**par**aesthesia' provides a problem; the prefix -par- must have undergone a process of lexicalization, since an unusual case of elision has occurred.

The perspective I would like to adopt is that, rather than being a part of the initial quasi-lexeme, this interfix, as its denomination indicates, is a variety of affix and has its own identity separate from quasi-lexemes, yet used as a linking element between them. As I previously mentioned, to assume that the phoneme [o] is an intrinsic part of an initial quasi-lexeme is hazardous. A quasi-lexeme like -actin- being represented as -actin**o**- bears no etymic evidence in Greek other than the fact that it has a case inflection of -*ος* in the genitive singular and of -*ον* in the genitive plural. But nowise can anyone prove that the phoneme [o] in actin**o**therapy is a remnant of the Greek case inflection. Instead, the choice for the interfix [o] may have been influenced by the morphology of the genitive case, yet with no etymic foundation. The same goes with the phoneme [i] in Latin.

Overall, the theory of interfixation seems more plausible for three reasons:

- Initial quasi-lexemes may end with the phoneme [o] in Greek and [i] in Latin prototypically but not universally. In contrast, the theory of interfixation conforms to all binary structures with quasi-lexemes, except if the second constituent begins in a vocalic phoneme, in which case, the interfix is not used.

- Lexicographers make regular mistakes with final quasi-lexemes like -opia, which actually should be divided into a quasi-lexeme -op- and a suffix -ia. They make the same mistake with initial quasi-lexemes that should be divided into a quasi-lexeme and an interfix.

- By separating the initial quasi-lexeme and the interfix in two distinct elements (e.g. -pych- + -o-), we would end up having a single entry form for each quasi-lexeme, whether it is used initially or finally (e.g. -psych-, -metr-, etc.).

It is prudent to claim that these interfixes are epenthetic in nature. Tournier (1985) refers to epenthesis as the emergence of an element that is not justified by its strict etymon. There is a dual reason for resorting to interfixation to form composites with quasi-lexemes: one is euphonic (it facilitates the pronunciation – as I said, it is usually not needed when the second constituent begins with a vocalic phoneme), the other is the influence of an analogy (the left-hand constituent in a classical compound is influenced by the morphology of its genitive case, just like the left-hand constituent in a hybrid compound – such as speed**o**- in 'speedometer' – is influenced by the morphology of classical and neoclassical compounds). I will address the issue of acquisition and structure of classical compounds in Part II. A.

Sergio Scalise (1984), in his comparison between affixes and quasi-lexemes, gives the argument that an affix cannot be a prefix in some lexemes and a suffix in others. Affixes are in a peripheral relation with their lexemes, and their function is immutable. Quasi-lexemes are in a pivotal relation with each other and with lexemes, and they can change semantically from being a head to being a modifier in a composite. However, I will retain Claudio Iacobini's (1998) argument that even if they both can be represented on a continuous scale, there is strong evidence for a clear-cut distinction between affixes,

which operate according to derivational rules, and quasi-lexemes, which operate according to compounding rules. Amiot and Dal's example of micro- corroborates that point. Since we already observed that quasi-lexemes belonged to the major lexical categories of noun, verb and adjective in their original language, and that they had a constant and specified meaning, it is evident that an element like -micr- (from *μικρός* 'small'), which changes from an adjective to a determiner in '**micr**osecond', does not only change meanings, but also joins a morphemic category composed of elements that are intended to be applied to lexemes rather than to concatenate with them. It is almost like affirming that exponents of LCRs need lexemes in order to be what they are, while complementing the semantic function of these lexemes.

2. Quasi-lexemes versus paleo-lexemes

To go back to Amiot and Dal's first prototype -lud-, I would hesitate to consider it a strictly initial quasi-lexeme. As a matter of fact, this constituent existed as a paleo-lexeme before it was attested as a quasi-lexeme. According to the OED, the noun 'interlude' (c1303) represents the first occurrence of the Latin lexeme *ludere* 'to play' in the English lexicon. This single example shows that the so-called complementary distribution between the quasi-lexeme -lud- and the French lexeme *jeu* is no more conclusive than would be the complementary distribution between -lud- and its English counterpart 'game/play', even though -lud-, *jeu*, and game/play are semantically equivalent.

Paleo-lexemes and quasi-lexemes share a similarity. If we look at them diachronically, they were both lexemes in their original language. However, in the borrowing languages, they lose their case inflection and their autonomy, to become bound constituents. Their dissimilarity, once again, lies upon more conventional criteria:

- Diachronically, paleo-lexemes derive from present Latin verb stems of the first, second, third, and fourth conjugations, as opposed to quasi-lexemes, which have the capacity to derive evenly from all the main lexical categories of constituents from Latin or Greek. Hence, paleo-lexemes have a more limited distributional range than quasi-lexemes.

- Paleo-lexemes do not concatenate with each other, as quasi-lexemes do. There is no such thing as an initial or a final paleo-lexeme.

- Paleo-lexemes are bound exclusively to affixes in order to form complete lexemes. Tournier (1991) points out that they behave as stems onto which affixes may be attached. A counterexample like 'genuflect' is interesting, because it has three possible interpretations:

- It violates the aforementioned rule, and the paleo-lexeme -flect- (from Latin *flectere* 'to bend') concatenates with the quasi-lexeme -gen- (from Latin *genū* 'knee').

- The paleo-lexeme -flect- belongs to a new morphemic category. It may, in the environment of quasi-lexemes, become one of them.

- The paleo-lexeme -flect- is immutable and instead compels the quasi-lexeme -gen- to undergo a form of grammaticalization.

To cover step by step these dissimilarities between paleo-lexemes and quasi-lexemes, I would like to start by drawing a list of common paleo-lexemes, divided into four groups according to their conjugations in Latin.

- First conjugation – verbs ending in *-āre* in the present infinitive:

-ceal-, -clam- (allomorph -claim), -clar-, -cumb-, -firm-, -frict-, -fut-[11], -mut-, -par-[12], -pect-[13], -pir- (allomorph -spir-), -port-, -pugn-, -sect-, -sult-[14], -vast-.

- Second conjugation – verbs ending in *-ēre* in the present infinitive:

-fess-, -par- (allomorph -pear-), -spond-, -tain-, -ter-, -vid-.

- Third conjugation – verbs ending in *-ere* in the present infinitive:

-cept- (allomorph -ceive), -cess- (allomorphs -ceed-, -cede), -cis-, -coct-, -cur-, -cuss-, -dict-, -duct- (allomorph -duce), -fect-, -fer-, -flect-, -flict-, -fract-, -gest-, -gress, -ject-, -junct- (allomorph -join-), -lect-, -lud-, -mit- (allomorph -miss-), -pel-, -pet- (allomorph -peat-), -pict-, -press-, -pon-, -rect-, -rupt-, -script- (allomorph -scribe), -sert-, -sist-, -spect-, -tect-, -ter-, -tract-, -vert-, -vict-.

- Fourth conjugation – verbs ending in *-īre* in the present infinitive:

-sent-, -vent-.

The first characteristic of paleo-lexemes is that, in order to become lexemes, they must be attached to affixes, and, more specifically, to prefixes and suffixes[15]. If we take the paleo-lexeme -ject- from the present infinitive *jacere*, we end up with this:

Prefixes	Paleo-lexeme	Suffixes[16]
ab- ad- con- de- -e- in- inter- ob- pro- re- sub- tra-	-JECT-	-abl- -ant -ary -ation- -dom -ee -er -ess -hood -ibl- -il- -ion- -ist -itious -iv- -less- -ly -ment -ness -or -ory -ress -rix -ur-

According to my three main lexicographical sources, all of the aforementioned prefixes except for -e- are terminal, that is to say, they end the derivational chain, when used in combination with the paleo-lexeme -ject-. This does not mean that it will be the same for all paleo-lexemes. As for suffixes, a small number of them are terminal. This tells us that, lexicographically speaking, paleo-lexemes have their limitations. Those that are not terminal can make use of only one additional suffix (e.g. pro-ject-**il-ist**).

The prefix retro- has been intentionally left out of the chart, as it represents a case of compounding, not by juxtaposition but by blending with the lexeme 'project' (retro- + [pro]ject > retroject). The date of first occurrence of that lexeme (1866) testifies that it was not made in the paleo-lexeme tradition, but as a neo-lexeme that has undergone a reduction of its signifier.

The general statement I can make about paleo-lexemes is that they are monosyllabic[17], and they usually derive from Latin verbs and turn into English verbs by means of prefixation. Subsequently, they may be nominalized or adjectivized by means of suffixation. For example, the Latin present infinitive *premere* turns into the following English verbs with various prefixes: compress, depress, express, impress, oppress, repress, and suppress. The verb is then nominalized by means of the suffixes -ment, -ion-,

-or, etc., and adjectivized by means of the suffixes -ful, -ibl-, -iv-, etc. Of course, they can undergo a secondary suffixation, as the right-hand hyphen on these suffixes attest: impress-**ibl-y**, express-**iv-ity**. Upon looking at the dates of first occurrence of 'suppress' and its suffixed derivatives, there is no doubt that the paleo-lexeme was first prefixed before being suffixed. When it comes to the verb 'repress', the issue is more arguable. The past participle of the verb and the derived noun occur for the first time in c1374 in Chaucer's poem *Troilus and Criseyde* within a few verses:

> *'With piete so wel **repressed** is*
> *That it unnethe doth or seyth amys […]*
> *And som so ful of furie is and despit*
> *That it sourmounteth his **repressioun**'.*

This example tells us that with paleo-lexemes, there is a spontaneous need to fill in the empty lexical categories. As Chaucer made use of the verb 'repress', he also nominalized it to remedy the lexical gap. This characteristic is common to paleo-lexemes and quasi-lexemes; however, quasi-lexemes being part of an open set of elements, their capacity to form new composites has been uninterrupted since they were first introduced into the English lexicon in the classical era.

In contrast with quasi-lexemes, paleo-lexemes can resort to parasynthetic processes to create new lexemes. Parasynthesis consists in binding two affixes, namely, a prefix and a suffix, simultaneously. An example is the noun 'affriction', made of the paleo-lexeme -frict- from present infinitive *fricāre* onto which the prefix af- (allomorph of a-) and the suffix -ion are attached at the same time. While there is no such verb as 'to affrict'[18], this paleo-lexeme gives us evidence that the order in the derivational chain of lexemic formation may not be entirely rule-governed. Another interesting example is the noun 'repugnance', made of the paleo-lexeme -pugn- from the present infinitive *pugnāre* onto which a prefix was first attached to make a verb 'to repugn'. Subsequently, the verb was nominalized by means of the suffix -ance to form 'repugnance'. However, the verb soon became obsolete, and, for lack of being able to identify it, lexicographers have tended to look at it as a parasynthetic derivative rather than as a lexeme formed by successive derivation.

In the framework of my theory of 'affixed paleo-lexemes exclusively', the interpretation of the aforesaid example 'genuflect' places us in a situation where categorial mutability should be envisioned. In other words, a paleo-lexeme may become a quasi-lexeme in a certain environment and under specific lexical needs. If we look at the paleo-lexeme -flect-, there is nothing that indicates its difference from other paleo-lexemes. Firstly, it forms a series of verbal lexemes such as **ante**flect, **circum**flect, **de**flect, **in**flect, **intro**flect, **re**flect and **retro**flect. Subsequent suffixal derivation is typical of paleo-lexemes: inflect**ion**, reflect**ive**. Yet with 'genuflect', we are not merely applying an exponent of an LCR to a paleo-lexeme in order to complement its semantic function; we are giving an internal argument to that paleo-lexeme, whereby a semantic relation between the two constituents will have to be determined. As I will delve into the issues of synthetic compound in Part II. C., and semantic relation in Part III. B., it is hereafter essential to point out that compounding, also referred to as concatenation, implies the interpretation of a binary structure, which is not always straightforward. The lexeme

'manumission' (1452), which is reported by the OED to have appeared before the verb 'to manumit' (1455), may be a case of back-derivation. Nonetheless, the semantic relation between the quasi-lexeme manu- and the paleo-lexeme -miss- is made even more complex due to the fact that the quasi-lexeme is not the internal argument of the paleo-lexeme in the same way that genu- is the internal argument of -flect-. Rather, the quasi-lexeme manu- should be considered as instrumental. The connecting link between manu- (X) and -miss- (Y) is something like 'Y using X as a means'.

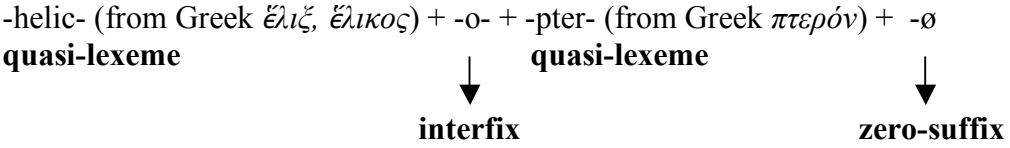
Eventually, the greatest problem when facing the difference between paleo-lexemes and quasi-lexemes is that a vast majority of Latin verbs in the present infinitive are strictly paleo-lexemes, but some of them have the capacity to be used equally as paleo-lexemes or as quasi-lexemes (although their use as paleo-lexemes is invariably anterior to that as quasi-lexemes). The paleo-lexeme -fug-, from Latin *fugere* 'to flee' (e.g. re**fug**e, subter**fug**e, trans**fug**e, etc.), also bears the morphemic category of quasi-lexeme (e.g. luci**fug**e, etc.). Not only that, but the quasi-lexeme -fug- has the capacity to be used causatively (e.g. febri**fug**e, somni**fug**e, etc.), from Latin *fugāre* 'to repel'. The paleo-lexeme -cid-, from Latin *caedere* 'to cut' (e.g. de**cid**e, etc.), also bears the morphemic category of quasi-lexeme (e.g. ligni**cid**e, etc.). Not only that, but the quasi-lexeme -cid- has the capacity to be used metonymically in the sense of 'to kill' (e.g. homi**cid**e, parri**cid**e, etc.). What I deduce from these examples is that quasi-lexemes not only have larger lexical categories of constituents than paleo-lexemes, but also use more extensively the grammatical and semantic modalities of classical languages. Furthermore, they are an open set of constituents, which lends itself to continuous production of new composites.

3. Quasi-lexemes versus fracto-lexemes and elements of blends

Warren (1990) divides quasi-lexemes into three groups, which are [Group I] allomorphs of model words (e.g -astr- from Latin *astrum* 'star' or -drom- from Greek *δρόμος* 'race'), [Group II] truncated forms of model words (e.g. cyber- from cybernetics or -holic from alcoholic) and [Group III] parts of model words (e.g. -gate from Watergate). Although not devoid of interest, her definition of quasi-lexemes encompasses more than the bound elements from Greek or Latin. No matter how unspecific the word 'quasi-lexeme' may seem, I will begin by justifying why quasi-lexemes are, in the strict sense, only [Group I], while considering that [Group II] and [Group III] are what I will name fracto-lexemes or what Adams (1973) refers to as splinters (the only difference being that [Group III] has elements that exist concurrently as unbound lexemes).

As I will subsequently prove by analyzing their lineage, quasi-lexemes are acquired from classical languages as composites or as individual elements, which have an etymic foundation. Deprived of their case inflections, Latin *astrum* and Greek *δρόμος* become -astr- and -drom-, yet their lexical meaning is intact: -astr- conveys the idea of 'star' or 'constellation' and -drom- conveys the idea of 'race'. The hyphens on each side indicate that non-derived quasi-lexemes are protolexical elements, onto which other elements are to be attached in order to form complete lexemes. As I mentioned earlier, I will indicate hyphens on both sides, leaving the option for other elements to be attached before or after the protolexical element.

If we take the example of 'helicopter', it is made up of four morphemes: two quasi-lexemes, an interfix, and a zero-suffix[19], as follows:



Further derivations of the lexeme 'helicopter' include 'helicopteric', where the zero-suffix has been substituted with the adjectival suffix -ic and 'to helicopt', made by back-derivation. Aside from affixal derivation, this lexeme is the base for a particular type of compounding referred to as blending.

Adams (1973) gathers a sample of morphemes, among which are heli-, and -copter. She argues that these morphemes stand for a particular source lexeme (in this case 'helicopter') in the formation of new lexemes like 'helibus', 'helidrome', 'heliport', or 'seacopter', 'ambucopter', etc. Other examples are -holic and -gate, which represent 'alcoholic' and 'Watergate' respectively in the formation of such lexemes as 'workaholic', 'chocoholic', 'pornoholic', 'technoholic', and 'Irangate', 'Nannygate', 'bastardgate', etc.

Although her approach is engaging, in so far as it highlights a new kind of morpheme with properties distinct from those of quasi-lexemes[20], there is, in my opinion, a further distinction to be made between elements of blends and fracto-lexemes strictly speaking. According to Outi Bat-El (2006), blends 'exhibit some sort of structural fusion, where a single word is formed from two words, and its meaning is thus contingent upon the semantic relation between the two base words' (p.1). I would add that the prerequisite for a blend to be called as such is that the semantic components of each source lexeme must be preserved in the output. Hence, an 'ambucopter' ought to have conjointly every semantic component of 'ambulance' and 'helicopter' to be considered a blend. The same goes with 'seacopter'. The type of semantic relation between the two source lexemes is of secondary importance and may vary across blends. In the case of 'ambucopter' and 'seacopter', I would suggest that the first is a dvandva, and the second is an endocentric compound. The bottom line is that in 'ambucopter', -copter should retain every semantic component of 'helicopter' (e.g. flying contraption, having a propeller on top, etc.) to be considered an element of a blend. In contrast, the constituent -holic, which we find in 'workaholic', has lost most of the semantic components it had in 'alcoholic'. It has only retained the semantic component 'addiction'. The same goes with -gate in 'Irangate', which has only retained the semantic component 'scandal' from 'Watergate'. What happens is that from a source lexeme, we extract a fragment of this lexeme onto which we reassign a specific meaning. Such examples as these will be called fracto-lexemes. Both fracto-lexemes and elements of blends undergo truncation in order to form new lexemes, but an element of a blend differs from a fracto-lexeme in that it is semantically integral in relation to its source lexeme, while a fracto-lexeme is subjected to a semantic specialization[21] whereby only one semantic component of its source lexeme will be retained.

If I summarize these structures, here is what it looks like:

	Element of a blend	Fracto-lexeme
Morphology	Either a truncated lexeme (e.g. heli-, -copter) or a complete lexeme (e.g. sea)	Truncated lexeme (e.g. -gate, -holic)
Semantics	Retains all semantic components of source lexeme	Retains only one semantic component of source lexeme

Ewa Tomaszewicz (2008) rejects the notion of a fracto-lexeme (which she incorrectly refers to as a final quasi-lexeme), stating that from the perspective of optimality theory, it simply conforms to the properties of a blend. However, her position is apparently limited to morphological theories. She fails to make the proper distinction between elements of blends and fracto-lexemes at the semantic level. The outcome is that while the concatenation of elements of blends may result in compounds[22] with various possible semantic relations, fracto-lexemes are more problematic, in so far as they display predictable semantic relations with the other constituents onto which they are attached (e.g. the series in -holic exemplifies a systematic relation of prepositional phrases: a workaholic is addicted to work, a chocoholic is addicted to chocolate, etc.).

Quasi-lexemes share a number of similarities with elements of blends. Both can concatenate with constituents of the same morphemic category. In other words, secondary compounding will be typical of formations with quasi-lexemes and formations with elements of blends alike. Another fundamental similarity is that they are both semantically integral. An element of a blend may be in a truncated form, but it still displays the same semantic components as its source lexeme does.

Their dissimilarities are threefold:

- Quasi-lexemes have an etymic foundation. Elements of blends are metanalytical, in so far as the truncation they undergo usually does not coincide with the source morpheme (e.g. heli- + -copter is a metanalysis of helic- + -o- + -pter- + -ø).

Quasi-lexemes find their source in classical languages. Elements of blends derive from lexemes that are already established. They proceed by metanalysis and concatenate with other elements in accordance with the rules of phonotactics. They have to be easily identifiable (e.g. -copter is more easily identifiable as deriving from ‘helicopter’ than -pter). Quasi-lexemes are not concerned with the issue of how easily identifiable they are. As a piece of evidence, the quasi-lexeme -al- in ‘arctalian’ is only made of two phonemes, and only an experienced etymologist will identify it. Likewise, elements of

blends do not have homonyms that are likely to make a composite ambiguous. Quasi-lexemes regularly do (e.g. there are two quasi-lexemes -cen-, one from the Greek *καινός* 'new' and one from the Greek *κενός* 'empty').

- Quasi-lexemes have no corresponding source lexeme. Elements of blends always do (e.g -copter = 'helicopter').

The core issue is that quasi-lexemes, unlike elements of blends, are protolexical elements first and foremost. They do not derive from a complete lexeme in English. An element of a blend was a part of a complete lexeme from which it has been extracted for the purpose of concatenating with one or more other morphemes. The lexeme 'dinophobia', which looks like it is the concatenation of two quasi-lexemes, is actually a blend of a composite with quasi-lexemes and another quasi-lexeme: dino[saur] + -phobia. Only by doing a componential analysis can we come to that conclusion. However, if the element of a blend has a corresponding source lexeme (e.g. dino- corresponds to 'dinosaur'), the two are not interchangeable. An element of a blend acts like a quasi-lexeme, in the sense that it has to be attached to another element to form a lexeme. Therefore it is crucial to differentiate between a truncated element (e.g. heli- or -copter), which is never used independently, and a truncation, which is used independently (e.g. 'necro' from 'necrology').

- Quasi-lexemes may occur in initial or final position in a composite. Elements of blends occur either in initial or final position, but not both.

As I mentioned earlier, quasi-lexemes should have the potential to occur in initial or final position of a composite (e.g. helico**pter**, **pter**odactylous). Elements of blends do not have this property. However, they may have several truncated forms of the same source lexeme, and these forms should be in complementary distribution (e.g. heli- in 'heliport' = -copter in 'ambucopter'). This proves that a blend functions exactly like a compound by juxtaposition, in the sense that an endocentric compound has a head and a modifier, and the head is always the right-hand constituent (e.g. helicopter airport > heliport). Dvandvas are more flexible and may rely more on identification and phonotactics than on constituent order (e.g. 'ambucopter' may as well be 'helibulance' but not 'heliance'). Furthermore, blends are often expandable. An expandable blend can be replaced by its corresponding 'compound by juxtaposition' (e.g. medicare = medical care). In other words, a blend is no more than a compound in its reduced form.

Quasi-lexemes also differ from fracto-lexemes, in the following ways:

- Quasi-lexemes are protolexical elements onto which other elements are attached. Fracto-lexemes are based on prototypes and form lexemes in a series.

Fracto-lexemes tend to function on the basis of a metaphorical series (e.g. the fracto-lexeme -thon means 'endurance', which is the transfer component between the prototype 'marathon' and the outputs 'telethon', walkathon', 'swimmathon', etc.). Another exemple is the fracto-lexeme -nography, which is extracted from the source

lexeme ‘pornography’ to create the outputs ‘warnography’ (with the complete lexeme ‘war’) and ‘carnography’ (with the truncated lexeme ‘carnage’). As their definitions testify – ‘warnography’ according to Warren (1990) refers to ‘literatures or films glorifying war and violence’, and likewise, ‘carnography’ would refer to ‘films, literatures and images glorifying carnage’ – the fracto-lexeme -nography has somewhat retained the semantic components of the quasi-lexeme -graph-, namely, ‘writing’. However, the hypothesis according to which ‘warnography’ and ‘carnography’ may be blends of ‘war’/‘carnage’ and ‘pornography’ is plausible at the morphological level but not at the semantic level, since the sexual component of ‘pornography’ is absent in these outputs. Instead, we find a connotative component of ‘pornography’, namely, ‘wild and unsettling’.

- Quasi-lexemes retain all of their semantic components when they concatenate to form composites. Fracto-lexemes retain one semantic component and do not concatenate with each other but are attached to elements of other morphemic categories.

Fracto-lexemes do not concatenate with each other, but they make use of lexemes and elements of blends to form new lexemes. When this element of a blend is in a truncated form, the fracto-lexeme behaves as if it were superimposed on the source lexeme (e.g. choco[late] + -holic > chocoholic). The hypothesis according to which ‘chocolate’ and ‘alcoholic’ are telescoped (choco[late] + [alco]holic > chocoholic) is ruled out, since -holic is not an element of a blend but a fracto-lexeme with a specific meaning reassigned to it. Conversely, when this element of a blend is a complete lexeme, the fracto-lexeme behaves as if it were juxtaposed to that lexeme (e.g. work + -holic > workaholic). Interfixation[23], which is normally not a characteristic of fracto-lexemes, is only resorted to in order for the new lexemes to mimic their prototype in terms of syllabification. Lexemes ending in a consonantal phoneme will resort to the interfix -a- (possibly to contrast with quasi-lexemic constructions). If they end in a vocalic phoneme, interfixation is not used (e.g. movie + holic > movieholic).

- Quasi-lexemes undergo metasemous changes, which extend their meaning and their distributive range. Fracto-lexemes do not lend themselves to metasemous processes. They have a fixed position and, therefore, a limited distribution.

Earlier, I mentioned Amiot and Dal and their approach to the quasi-lexeme -log-, which has undergone a metasemous transfer from ‘speech’ to ‘specialist’[24]. Interestingly, this quasi-lexeme, which could originally be used either in initial or in final position (e.g. ‘**log**ophrenia’, ‘tauto**log**y’), undergoes a metonymy, whereby it loses its potential to be used initially (e.g. nephro**log**y). I will support Amiot and Dal’s position, according to which, a quasi-lexeme that is confined to a fixed position in a composite can be legitimately suspected to be an affix, and I will extend that principle to fracto-lexemes. As a matter of fact, as I already discussed, fracto-lexemes not only have a limited distribution, but their meaning is fixed. Besides, they serve in the formation of new lexemes, in which they will have invariably the same meaning. If, as Iacobini (1998) says, there should be a clear-cut distinction between affixes, which function in

accordance with derivational rules, and quasi-lexemes, which function in accordance with compounding rules, then fracto-lexemes are likely to be part of a morphemic category that is born of derivational principles. Firstly, fracto-lexemes are not pivotal in relation to the other morpheme to which they are attached and cannot change from being a head to being a modifier in the formation of a new lexeme. Secondly, they do not concatenate with each other but are attached to elements from other morphemic categories, just like affixes are. Lastly, their lack of potential to change meaning in the formation of new lexemes makes me assume that this fairly recent word formation process is actually a subcategory of affixation, rather than compounding.

For more clarity, I may illustrate these various features of quasi-lexemes, fracto-lexemes, and elements of blends in the following chart:

	Quasi-lexemes	Fracto-lexemes	Elements of blends
Are formed by concatenation	**X**		**X**
Have distributional properties	**X**		
Resort to interfixation	**X**		
Reveal Metanalysis		**X**	**X**
Lend themselves to metasemy	**X**		**X**
Have a Prototype		**X**	**X**
Display semantic integrity	**X**		**X**
Have source lexemes		**X**	**X**
Are truncated elements		**X**	**X**

This chart shows that elements of blends share features with quasi-lexemes and with fracto-lexemes alternatively. However, quasi-lexemes and fracto-lexemes are dissimilar in every way. Therefore, I conclude that an element of a blend is a morphological reduction of a complete lexeme with which it shares all of its semantic features; a fracto-lexeme is a morphological reduction suggestive of a model with which it shares connotative features; while a quasi-lexeme, by being irreducible to a source lexeme, is a protolexical element that displays strictly denotative features.

C. Contrasting quasi-lexemes with complete lexemes

After drawing the line between quasi-lexemes and other bound morphemes, we have come to realize that quasi-lexemes, by being irreducible to a source lexeme, are very much like complete lexemes, except that they are not independent constituents. On closer look, there are other characteristics that may enable us to distinguish one from the other. As I pointed out earlier, Guierre contends that quasi-lexemes have formal, distributional, and segmental properties, which make them elements of a morphemic category governed by distinctive rules. Although these properties are essentially morphosyntactic, I would like to examine them one by one in order to establish a preliminary contrast between quasi-lexemes and complete lexemes.

- Formal properties

Regardless of their semantic content, quasi-lexemes have a peculiar form that has led me to refer to them as protolexical elements. To be precise, they appear as rudimentary elements that need other elements to become complete lexemes. In spite of their semantic integrity, quasi-lexemes are not independent lexemes but bound morphemes syntactically comparable to affixes. A complete lexeme may be used in combination with another to form a compound, but if it were not used in combination with another form, it would still remain a complete lexeme. For example, 'heart' and 'disease' are two lexemes on their own, which do not need to concatenate in order to have access to discourse. However, -cardi- and -path- are two protolexical elements, which depend on each other, with the additional support of affixes, to form a complete lexeme.

While such quasi-lexemes as 'heart disease' and 'cardiopathy' may be two complete lexemes, it is evident that their forms are different. Firstly, 'heart disease' has constituents that are neither tied nor hyphenated but spaced. 'Cardiopathy', like any other composite with quasi-lexemes, has constituents that are tied together. Secondly, the law of affix requirement for quasi-lexemes, according to which a composite must have at least one affix, is not applied in the case of a concatenation of independent constituents. I indicate 'at least one affix', since, as I have discussed earlier, interfixes may be dropped when the second constituent begins in a vocalic phoneme (e.g. podalgia). However, as far as suffixes are concerned, unless the original Greek or Latin case inflection has been retained (e.g. philodendr**on**) or the composite has been exposed to the lexical rules of a borrowing language before entering the English lexicon (e.g. demagog**ue**), all composites with quasi-lexemes should end with a vernacular English suffix. The question of whether or not a zero-suffix is an actual suffix can be raised in certain instances, notably when a composite is borrowed from French. For example, we know that the lexeme 'helicopter' was borrowed from French, which had applied its own lexical rules to it, including the use of diacritical signs, to form *hélicoptère* from two quasi-lexemes[25]. As a consequence, it is legitimate to think of the English lexeme 'helicopter' as having undergone a graphic assimilation from French. Nevertheless, looking at the example of 'philodendron', there is evidence that a case inflection from Greek or Latin may be dropped to leave room eventually for a vernacular suffix, as the lexeme 'philodendrist' testifies. Likewise the

French nominal suffix in 'demagog**ue**' has been dropped and replaced by such English suffixes as -y and -ism in the formation of 'demagogy' and 'demagogism', among others. I would, therefore, consider the apparent lack of a suffix in 'helicopter' as exemplifying a case of zero-suffix, that is to say a suffix that is not actualized at the level of the morphological structure but is semantically equivalent to the French suffix in *hélicoptèr**e***.

Complete lexemes are not subjected to the law of affix requirement. They may resort to affixes in order to form compounds (e.g. light-heart**ed**), but they may as well be formed without any, as shown by the example 'heart disease'. They are self-sufficient and would resort to affixation only for the purpose of syntactic derivation. Quasi-lexemes undergo derivation but are never self-sufficient.

Lastly, I would like to approach the concept of bound constituent from the viewpoint of paraphrasability. Because quasi-lexemes are protolexical elements, rather than independent lexemes, I would argue that they are never paraphrasable. I may say that a toothache is when a tooth aches, but I may not say that an odontalgia is when an -odont- -alg-. I will come back to this point in Part II. C.

	Tied together	Under the law of affix requirement	Paraphrasable
Complete lexemes as elements of compounds	Yes or No	No	Yes
Quasi-lexemes	Yes	Yes	No

- Distributional properties

Although quasi-lexemes and complete lexemes have distinct formal properties, they usually have a semantic correspondence. This does not mean that each complete lexeme corresponds to a quasi-lexeme, but rather that each complete lexeme that has a corresponding quasi-lexeme will display a componential analysis similar to that of its classical counterpart. In other words, if we made a componential analysis of 'tooth' and -odont-, we would end up with similar results, namely, 'bonelike structure', 'rooted in mouth', 'used to chew', etc. Even though, the composites 'toothache' and 'odontalgia' may belong to different registers, yet they still render the same componential analysis. We have to remember that quasi-lexemes stem from classical languages where at a certain point in time, they were not quasi-lexemes but complete lexemes. Their use in English, as in any other language deprived of grammatical cases, has resulted in a morphological alteration of the lexeme, while the semantics has remained intact.

When it comes to analyzing the distribution of quasi-lexemes, the first observation I shall make is that, like complete lexemes, they are used in a variety of collocations. They create semantic relations between each other, and these relations are

not predictable. For example, 'logomachy' has a relation of cause, whereas 'chiromachy' has a relation of means. Warren (1990) states that, except for dvandvas, quasi-lexemes always form composites with the left-hand constituent being the modifier and the right-hand constituent being the head. Although a composite with quasi-lexemes is not paraphrasable, as I pointed out, we can gloss from the aforementioned examples in which -mach- is the semantic equivalent of 'fight': 'logomachy' is a type of fight, 'chiromachy' is also a type of fight. From that gloss, we may conclude that -mach- is the head of each of these composites[26]. However, while Warren's observation should be valid for a large number of composites, it is still not a general rule. There is a kind of composite that is headless, at least at the level of the morphological structure, and which linguists commonly refer to as an exocentric compound. It is commonly claimed that the head is actually implicit in these composites. For example 'pachyderm' is not a type of skin but a mammal with thick skin. The head would be outside of the composite. Likewise, although I will address the question of primary versus synthetic compounds in Part II. C., I can already say that 'misogyny' has a hidden verbal element as the left-hand constituent and an internal argument as the right-hand constituent. Therefore, we cannot say that 'misogyny' is a type of woman, because -gyn- is not a head. Furthermore, this example shows how suffixal derivation with quasi-lexemes will always be on the right-hand constituent, whether this constituent is the head or not. If we compare quasi-lexemic formations (e.g. mysogyn**y**, pachyderm**ic**, etc.) with formations with complete lexemes (e.g. displac**ed** person, shoot**ing** star, etc.), the distribution of suffixes in composites with quasi-lexemes is localizable and immutable.

In terms of distribution, we have to admit that the reason why quasi-lexemes are more limited than complete lexemes is because they stem from classical languages where they only existed in three lexical categories, namely, noun, verb, and adjective. In comparison, complete lexemes of nearly every lexical category may be used in compounding (e.g. merry-go-round, none-so-pretty, etc.). Lastly, most quasi-lexemes, like complete lexemes, have the potential to be used initially or finally, but there are quasi-lexemes that are problematic. As an example, all quasi-lexemes that stem from classical adjectives, such as bath-, pach-, tach-, etc. from Greek *βαθύς* 'deep', *παχύς* 'thick', *ταχύς* 'swift', etc. are only used as left-hand constituents and cannot be the head of a composite. If we compare the quasi-lexeme -bath- with its native counterpart 'deep', we notice that the distributional properties of the quasi-lexeme are more restricted, as -bath- is lexicalized only as a left-hand constituent (e.g. bathometer), whereas 'deep' may be a modifier (e.g. deep space) or a head (e.g. skin-deep).

- Segmental properties

In section B. 3., I talked about how a composite like 'pornography', made up of two quasi-lexemes and two affixes, could undergo metanalysis, whereby the suffixed quasi-lexeme -graphy would become the fracto-lexeme -nography. Not only has the segmentation of the composite been modified, but also have the semantic components of -nography.

Truncation is a lexicogenic process that occurs essentially with complete lexemes. A complete lexeme may be a simple or compound lexical unit other than a quasi-lexeme

(e.g. [in]**flu**[enza], **vet**[erinary surgeon]), or a composite with quasi-lexemes (e.g. **cinema**[tography]). A quasi-lexeme as a protolexical element is never truncated. For example, the lexeme 'cinema' is a truncation of the compound 'cinematography'. It is not a truncation of the quasi-lexeme -cinemat-. A truncation like 'cinema' may have access to discourse. A quasi-lexeme may not. A truncation has the exact same semantic components as its source lexeme. A common mistake is to consider that a linguistic **'morph'** and a mathematical **'graph'** are quasi-lexemes, on the ground that they share the same sequence of phonemes as -graph- and -morph-. This is why I advise using hyphens on each side of the quasi-lexeme to highlight its syntactic incompleteness. The lexemes 'morph' and 'graph' are truncations of 'morphemic representation' and 'graphic formula' respectively. They have both made use of the quasi-lexemes -morph- and -graph- before resorting to suffixation, compounding, and truncation. Their meaning equals that of their respective source lexeme.

Metasemy plays an important part in segmental procedures, as fracto-lexemes have shown. In the framework of quasi-lexemes, we find out that composites may equally undergo semantic changes but may also take a somewhat different path. If we consider the lexeme 'photogenic' diachronically, it first appeared as an ellipsis of 'photogenic drawing' (1835). It was a device whereby 'one could produce an image by the chemical action of light on a sensitized surface'. The lexeme 'photogenic' itself was making use of two quasi-lexemes -phot- and -gen- in their literal senses of 'light' and 'production'. In the meantime the lexeme 'photography' made its appearance, and a new lexeme was produced: 'photogenic' with the meaning of 'who shows to advantage in a photograph' (1922). Most lexicographers would regard this lexeme as a derived meaning of its earlier version. However, on closer look, there is no idea of light involved in the latter meaning of 'photogenic' but the idea of photography. What happened is that '**photo**[graphy]' was truncated and blended with a fracto-lexeme -genic, which, incidentally, is segmented in the same way as the suffixed quasi-lexeme -genic, which means 'producing'. This fracto-lexeme, according to Adams (1973), took the meaning of 'eminently suitable'. Therefore, what has been mistaken for a case of metasemy of -genic was in fact a graphic convergence of two lexemes with different morpho-semantic evolutions. The fracto-lexeme -genic has been used in the series 'telegenic', 'cinegenic', 'phonogenic', etc. in which every first constituent is a truncated form of a composite with quasi-lexemes, namely, 'television', 'cinematography', 'phonography', etc. This example gives us evidence that composites with quasi-lexemes may serve as bases for subsequent metasemous processes involving elements of blends, fracto-lexemes, complete lexemes, and truncations, in the same fashion that simple or compound lexical units do. In addition to this, the meaning of each individual quasi-lexeme and its relation to the other constituent(s) is crucial to draw the proper semantic lineage of the composite. At this point, I should delve into the issue of acquisition and structure of composites with quasi-lexemes and demonstrate how they follow the pattern of traditional compounding.

PART II. COMPOUNDING QUASI-LEXEMES: ACQUISITION AND STRUCTURE

A. Classical, neoclassical, and hybrid compounds

Henri Cottez (1980) refers to the category of unbound morphemes, of which quasi-lexemes are a part, as 'formants'. From a strictly lexicographical perspective, although composites with quasi-lexemes should be included in general dictionaries since they are lexical elements, the issue of whether or not we ought to include formants, which are no more than semiotic elements, is more debatable. His argument is as follows: is a dictionary merely a collection of simple or compound unbound units, or is it legitimate to integrate in it protolexical elements, which bear semantic components but exist only as elements of construction? The answer to this question may be found through a diachronic analysis of the origin of quasi-lexemes.

Quasi-lexemes may be semiotic rather than lexical units; however, they have not been primarily integrated in the English lexicon as quasi-lexemes but as composites with quasi-lexemes. English made use of composites with quasi-lexemes as early as the Middle Ages, either to fill a lexical gap in the social, economical, and scientific fields, or to follow the example of languages like French, whose prominent figures, in a deliberate act of linguistic vogue[27], were already revolutionizing their lexicon with newly acquired composites from classical languages. The passage from classical composites to neoclassical composites is what I will describe as a deconstruction of lexical composites into semiotic units and a reconstruction of these semiotic units with other semiotic units to form new composites. In the case of formations of hybrid composites, the deconstruction of classical composites is the same, but we reconstruct these semiotic units with vernacular English lexical units.

At this point, I would like to examine one by one these three categories of composites or 'compounds', which are classical compounds, neoclassical compounds, and hybrid compounds.

- Classical compounds

Classical compounds are, in the strict sense, compounds that stem from classical languages where they already existed as compounds and not simply as individual elements. They represent a variety of loanwords, but they are not the semantic equivalent of loanwords, in so far as they are only compound lexical units, whereas loanwords may be either compound lexical units or simple lexical units. I would suggest that the category of classical compounds is actually a subcategory of borrowing. It is important to notice that for a large number of these borrowings, a vernacular suffixal derivation occurs in English. However, there are a few borrowings that retain their case inflection in place of a vernacular English suffix (e.g. rhinocer**os**, rhododendr**on**, etc.). In such cases, we talk of a lexicalization of syntactic categories. In these classical compounds, the case inflections, which exemplify the third and second declension nouns respectively, lose their syntactic function and gain the status of affixal derivatives.

Lexicographical criteria should help us define a further distinction between direct borrowing and indirect borrowing. A classical compound is considered a direct borrowing when it stems directly from Greek or Latin, whether a vernacular suffixal derivation has occurred or not. In contrast, an indirect borrowing stems from Greek or Latin through another language, typically French. This second type is by far the most common type of borrowing. The question of whether a given classical compound partakes of direct or indirect borrowing is all the more relevant, since, in addition to dealing with the syntax of Greek or Latin, an indirect borrowing is likely to carry syntactic and lexical features from the intermediate language. For instance, there are a number of indirect borrowings from French such as 'astrolog**ue**', 'ideolog**ue**', 'philolog**ue**', 'theolog**ue**', etc., which have retained, at least temporarily, the French agentive suffix[28].

The last distinction I would like to make is between morphosemantic borrowing and what Cottez refers to as 'adaptation', which is actually no more than a morphological borrowing. This latter phenomenon consists in borrowing a lexical unit with its signifier and assigning a new meaning to it. An example is 'fabulation', which stems from the Latin *fābulātio* in the sense of 'conversation'. However, there is no such meaning in English. The reason is that English borrowed only its signifier from Latin and assigned the meaning 'fictitious story' to it. Leaving aside the case inflection, the signifier is intact, but the meaning is altered.

As anyone may already suspect, the vast majority of classical compounds is morphosemantic. However, there are a few cases of morphological classical compounds, as the example 'erotomania' suggests. It is interesting to notice that this particular classical compound existed in Greek and meant 'love whim'. The lexical unit *μανία* itself was no more than an augmentative of the lexical unit *φιλία*. As English borrowed the compound from Greek, a new major semantic component was assigned to it, namely, 'pathological drive toward'. Therefore, we may assert that this classical compound is merely morphological, since it was borrowed from Greek without its original meaning. Likewise, 'telescope' may have been borrowed from Greek *τῆλε* 'distant' and *σκοπειν* 'to observe', yet it has never been used as a characteristic for any animate being. Instead, it has become the name of a contraption that a person can use in order to 'observe from a distant location'.

The early zoological nomenclature includes several examples of morphological classical compounds. What scientists did is borrow a set of classical compounds from Greek or Latin, and apply them to their new zoological species. However, as we will notice, no matter how different the sense in English may be from the one in Greek or Latin, the two are still bound by a metonymical relation. For example, in Greek, 'oxyrhynchus' is made up of two lexemes *ὀξύς* 'sharp' and *ρύγχος* 'snout'. Scientists have retained the signifier and, rather than using the compound as an attribute for any zoological species characterized by sharp snouts, they have used the compound to label a particular ornithological species. Therefore, if the Greeks were entitled to say that whatever species <u>has</u> oxyrhynchus, in English, by contrast, we say that a particular species <u>is</u> oxyrhynchus. Similarly 'brachycephalus', from Greek *βραχύς* 'short' and *κεφαλή* 'head', is not applied to any species with a short head but to the particular ichthyological species with such a characteristic. At this point, it is essential to differentiate between a morphological classical compound, which is a borrowing of the

signifier only, and a morphosemantic classical compound, which has been borrowed with its signifier and meaning conjointly, but has subsequently undergone metasemy. I will tackle the latter process in Part III. C.

- Neoclassical compounds

The glossary of quasi-lexemes found at the end of this dissertation dates quasi-lexemes on the basis of their first occurrence in a compound at the moment when they are borrowed. For example, the quasi-lexeme -arch- dates back to the Middle Ages. It owes its respectable age to the fact that it entered the English lexicon in the form of the classical compound 'patriarch' borrowed from the Greek *πατριάρχης* around the 10th century ('*... ælfrede cyninge domne helias* ***patriarcha*** *on gerusalem*[29] *...*' Unknown author).

In order to establish the transition between classical and neoclassical compounds, it is crucial to understand the concept of 'date of productivity', as quoted by Cottez. The date of productivity for a quasi-lexeme is the decisive moment in time when this quasi-lexeme is extracted from its compound lexical unit and concatenated with another quasi-lexeme to form a new compound, which did not exist in the original language. For example, the classical compound 'genealogy' dates back to the early 14th century. As for the classical compound 'theology', it was borrowed soon afterward in 1362. Therefore, we may say that -log- is a 14th century quasi-lexeme. However, the date of productivity for the quasi-lexeme -log- is 1586, which is when this semiotic unit was extracted from its compound lexical unit and concatenated with the quasi-lexeme -path- to form 'pathology'. Hence, the 16th century is the beginning of a new era in word formation, as 1586 does not only mark the moment when -log- became productive in English, it also marks the first occurrence of a neoclassical compound.

In short, a neoclassical compound uses semiotic units of Greek or Latin origin to form a compound that did not exist in the original language, but which conforms to the syntactic pattern of that language[30]. The neoclassical compound 'chronology' does not mark the date of productivity of -log-, which is 1586, but it marks the date of productivity of -chron-. Prior to that, the simple lexical unit 'chronicle' had made its first appearance in 1303. Interestingly, 'chronicle' is not a compound. What we deduce from this is that neoclassical compounds do not necessarily pattern themselves after classical compounds. The theory I would form is that a lexical unit from Greek or Latin is first borrowed and then dissected into semiotic units, but as long as this lexical unit remains opaque, its semiotic units cannot lend themselves to productivity. For example, should we examine the lexical unit 'chronicle', we would gather that it may be dissected into two semiotic units, namely, -chron- and -icle. The suffix -icle is opaque. It may have been influenced by the word 'article', due to their paronymy. However, the initial semiotic unit -chron- stems from Greek *χρόνος* 'time'. Before the classical derivative 'chronicle' was dissected, the semiotic unit -chron- was not yet a quasi-lexeme, as it had not served to form a compound with a semantic relation between its constituents. Therefore, the date of productivity of the semiotic unit -chron- coincides with the moment when it became a quasi-lexeme. This is how it differs from the quasi-lexeme -log-, which was already a quasi-lexeme nearly three centuries before it became productive.

This can be summarized as follows:

First Step		*Second Step*		*Third Step*
Lexical unit borrowed from Greek or Latin	→	Dissected into semiotic units	→	Unless opaque, the semiotic units form the basis for neoclassical compounds
Simple lexical unit 'chronicle' (1303)	→	-chron- +-icle	→	**chron**ology (1593) chronometer (1715) etc.
Compound lexical unit '**gene**a**log**y' (c1300)	→	-gene- + -a- + -log- + -y	→	pathology (1586) chronology (1593) mineralogy (1690) geneagenesis (1864)

The bolded semiotic units indicate when they became quasi-lexemes; the underlined semiotic units indicate their date of productivity.

The passage from classical compound (or even classical derivative) to neoclassical compound involves a necessary step from complex structure, to elementary structure, back to complex structure. An interesting aspect of this passage is that once extracted, an individual semiotic unit may be semantically divided to form neoclassical compounds with distinct applications. Cottez points out that the quasi-lexeme -log- has seven distinct applications, as the examples 'neology', 'dactylology', 'pathology', 'tetralogy', 'anthology', 'homology', and 'philology' testify. Their morphemic category does not change, but they undergo variations in meaning. In contrast to this, there are quasi-lexemes like -brach- or -cephal- that never undergo variations in meaning. The meaning of a compound like 'brachycephalous' (where -brach- = X and -cephal- = Y) will be analyzed as XY is a Y that is characterized by X. However, for lack of having only one possible application, most semiotic units will be semantically divided in their relation with the other semiotic unit with which they concatenate. The semiotic unit -therap- has a different function in 'thalassotherapy' than it does in 'psychotherapy'. Likewise, the classical compound 'funambulist' led to the formation of a neoclassical compound 'somnambulist'. Despite the fact that these two compounds have the same head constituent -ambul-, their respective applications are distinct; they depart from each other in their semantic relation to the other semiotic unit with which they concatenate. I will explore these distinctions in more detail in Part III. B.

- Hybrid compounds

The particularity of neoclassical compounds is that they are not inherent to classical languages. Although they conform to the syntactic pattern of Greek or Latin, they still belong to the vernacular language that produces them. English lends itself to such productions. However, in many occasions, neoclassical compounds are produced by languages like French; consequently, English is not a producer of that new compound but merely a borrower.

The label 'hybrid compound' applies to a compound that is not only produced by another language than Greek or Latin, but that also concatenates a vernacular lexical unit with a classical semiotic unit. Hybrid compounds represent a fairly new process of word formation. The earliest example in English is 'bureaucracy' (1818), which was subsequently parodied by 'beerocracy' (1881). Interestingly, 'bureaucracy' was produced in French and then borrowed by English. Nevertheless, this is quite an unusual phenomenon. As a matter of fact, hybrid compounds generally differ from neoclassical compounds, in so far as they are produced outside of a certain classical language, and are inherent to that language. In other words, English has its own hybrid compounds just like French does. Occasionally, they cross languages through loan translations. The loan translation of a hybrid compound will only translate the vernacular lexical unit, while the Greek or Latin semiotic unit remains unchanged. Hybrid compounds may concatenate a non-truncated simple lexical unit with a quasi-lexeme (e.g. speed + -o- + -met- + -er > speedometer) or a truncated simple lexical unit with a quasi-lexeme (e.g. garb[age] + -o- + -log- + -y > garbology).

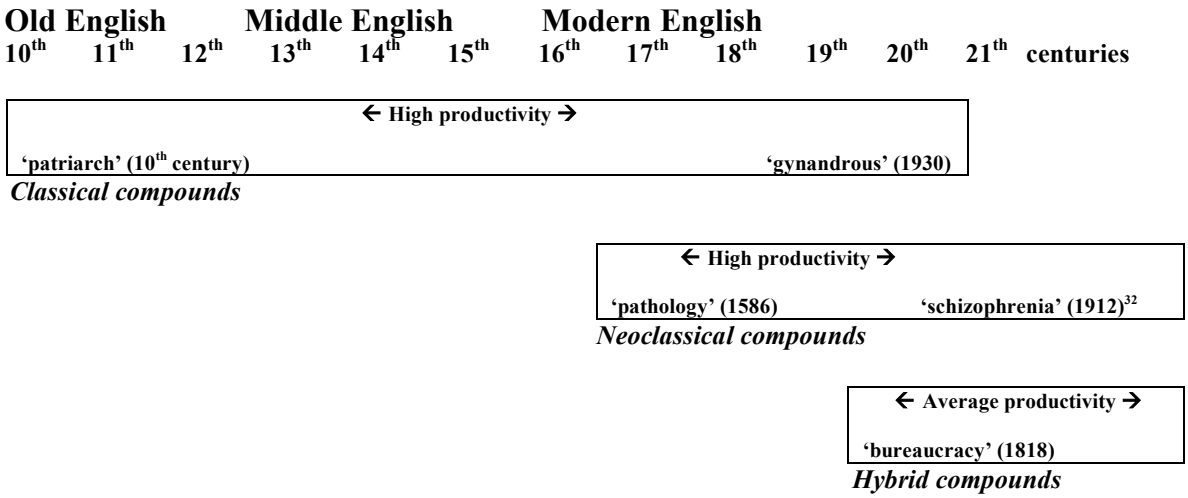
Hybrid compounds have two possible origins:

- They are intentionally humorous, in which case, they may or may not have a scientific or technical counterpart readily available in the lexicon. For example, 'speedometer' is the semantic equivalent to the neoclassical compound 'tachymeter'. While 'tachymeter' is a neoclassical compound that was originally produced in French, the hybrid compound 'speedometer' belongs exclusively to English. Additionally, 'speedometer' focuses more on the infringement of the law by drivers. It is more specialized than 'tachymeter'. Also, the hybrid compound 'bureaucracy' did not project the same facetiousness in English as it did in French when it was first produced, and in the long run it has undergone the wearing effect of time, to the extent that what was once considered humorous has now become commonplace.

- They are produced for lack of knowledge of classical etymons. For example, a columnist wrote an article in the *Miami Herald*, in which he mocked celebrities' surgical procedures and invented the hybrid compound 'chinoplasty', in place of 'genioplasty' from the Greek *γένειον* 'chin'[31]. Likewise, in the late 19th century, an American reporter substituted the neoclassical compound 'sinologist', glossed as 'one versed in the Chinese culture', with the more approachable hybrid compound 'Chinologist', which has been subsequently lexicalized.

Historically, there is no distinct succession between classical, neoclassical, and hybrid compounds. These three processes should be regarded as overlapping each other. In other words, when neoclassical compounds started to be produced, English continued to borrow classical compounds from Greek or Latin, either directly or through French. Similarly, when hybrid compounds started to be produced, neoclassical compounds were still very productive.

I would like to represent this dynamic production as follows:



In the present section, I have been referring to composites with quasi-lexemes as 'compounds'. Although I will be devoting Part IV. to test these quasi-lexemes through theories of compounding, I can state here that these semiotic units named quasi-lexemes were indeed lexical units in Greek or Latin, and they formed compounds with semantic relations between constituents. Therefore, the question as to whether or not a classical compound may be considered a compound lexical unit in English directs us to the question of the transparency of its structure. As long as a borrowed compound is opaque in terms of what its semiotic units are, the chance is that it will not be identified as a compound but as a simple lexical unit. For example, once borrowed, the lexical unit 'blitzkrieg', from German *blitz* 'lightning' and *krieg* 'war', has to be dissected and recognized as having two distinct primary lexical units that are semantically related to each other, before it can be identified as a compound. In contrast, the lexical unit 'aide-mémoire', from French *aide* 'aid' and *mémoire* 'memory', is more straightforwardly accepted as a compound. Therefore, if we can assume that neoclassical and hybrid compounds display features of compounding, on account of their being produced with a full understanding of what the semiotic and lexical units are and how they relate to each other, would we not be entitled to have the same approach with classical compounds, once their semiotic units have been identified individually and in relation to each other?

B. Constituent order in compounding

The fact that the syntactic structure of lexical elements of a compound in Greek or Latin should be the same as in English, with the head on the right and the modifier on the left[33], is only apparently favorable to the formation of neoclassical and hybrid compounds. Earlier, I mentioned the quasi-lexemic formation 'cardiopathy', which happens to be semantically equivalent to the formation with complete lexemes 'heart disease'. The head constituent in both compounds is on the right, the modifier constituent on the left, and, although 'cardiopathy' is not paraphrasable, we can still deduce from its semiotic units that the compound as a whole is a hyponym of the meaning carried by the semiotic unit -path-. Incidentally, this neoclassical compound was produced in French, which, in the tradition of Romance languages, forms its vernacular compounds with a reverse constituent order, that is to say, with the head on the left, the modifier on the right, and a preposition to link them (e.g. 'maladie de coeur', literally 'disease of heart'). What this example shows us is that French may resort to a different constituent order when compounding vernacular elements, yet neoclassical compounds produced in French are formed according to the prototype of classical compounding. In other words, 'cardiopathy' is not a heart but a disease. It is patterned after classical compounds, such as 'cephalgia', which have the same constituent order and syntactic relation between their constituents. When borrowing neoclassical compounds from French, English may therefore discover and occasionally retain a suffixal derivative that is inherent to French, as the example 'demagog**ue**' attests; however, the constituent order and syntactic function of the constituents do not undergo any change from the Greek or Latin prototypes.

I previously advocated the use of one entry form for all quasi-lexemes, and hyphens on both sides to indicate their semiotic rather than lexical nature. This standard is valid for quasi-lexemes that are used in initial position of a compound (e.g. a**morph**ophyte), in final position of a compound (e.g. anthropo**morph**ist) or in a derivative (e.g. a**morph**ous). The integration of a quasi-lexeme into the English lexicon through a classical compound may, however, be limited to one position only. For example, both the derivative 'amorphous' and the compound 'anthropomorphist' are borrowed from Greek, but the compound 'amorphophyte' is not a classical production. Therefore, the quasi-lexeme -morph- has a productivity that dates from the late 16th century, when it first occurred as a modifier of the lexical unit *φυτόν*. But it did not become productive as the head of a compound until the 19th century, when it was concatenated to various semiotic units such as -anthr-, -phyll-, -zo-, etc. to form the popular neoclassical compounds 'anthropomorph', 'phyllomorph', 'zoomorph', etc. To change the position of the quasi-lexeme in the compound granted it a new syntactic function and expanded its range of possible applications.

To address the issue of how interchangeable quasi-lexemes are within a compound, I would begin by saying that in vernacular English, there are three different patterns related to constituent order constraints, as Tournier (1985) demonstrates:

- The order of constituents is fixed

When we try to change the order of constituents, the compound loses its meaning. For example, a ‘blackbird’ or a ‘bellhop’ cannot be conceived as a ‘birdblack’ or a ‘hopbell’.

- The order of constituents may be different

Upon changing the order of the constituents, we end up with a lexicalized compound that has a different meaning. A typical example is the pair ‘doghouse’ vs. ‘housedog’. Occasionally, the compound that we derive is not lexicalized but plausible. For example, the compound ‘lamp-house’ as a ‘place that manufactures or repairs lamps’ could be changed into ‘house lamp’, which I would define as a ‘lamp that is designed exclusively for a house’.

- The order of constituents is open

When the order of constituents is changed, the compound has the exact same meaning. This variety of compound, made up of two nominal constituents, is commonly referred to as dvandva. We can make a further distinction between a dvandva that blends the two constituents into one (e.g. an ‘ice-cream’ is also a ‘cream ice’) and a dvandva whose constituents represent the two functions of the thing or person expressed by the compound (e.g. a ‘bed-settee’ is also a ‘settee-bed’).

In light of this interpretation of compounds based on constituent order, I would say that compounds with quasi-lexemes have two major restrictions:

- Syntactic restriction

Vernacular English produces compounds with constituents that benefit from a large range of lexical categories. These constituents may be verbs, nouns, or adjectives, but also adverbial particles (e.g. away, back, down, over, etc.). This variety of lexical categories empowers vernacular English to form compounds with manifold syntactic relations, including compounds in which the order of the constituents can be switched and made up into compounds with different meanings, in the same way that other lexical categories can (e.g. overrun vs. run over, downcast vs. cast down, etc.). Because of the restricted lexical categories of their Greek or Latin etymons, which derive only from adjectives, adverbs and nouns, compounds with quasi-lexemes do not have such a productive diversity.

- Derivational restriction

When switching the order of constituents, the rule of vernacular compounds is that each derivational morpheme remains attached to its lexical unit. For example the compound ‘piano player’ may have its constituents switch into ‘player piano’, which is

defined as a ‘self-playing piano’. Even though the non-derivative lexical element ‘play’ has a different syntactic function in ‘player piano’ than it does in ‘piano player’, its nominal suffix -er remains attached to it. In contrast, compounds with quasi-lexemes do not allow such a movement of suffixes. In compounds with quasi-lexemes, an English suffix serves as a substitute for a case inflection, which, in the tradition of Greek or Latin grammar, can only be attached to the right-hand constituent of a compound (e.g. homicid**ium**, rhododendr**on**, etc.). Therefore, the compound ‘graphology’ can only have its semiotic units switched into the compound ‘logography’.

In spite of these restrictions, quasi-lexemic compounds embrace more or less the same pattern as vernacular compounds do. First of all, as I have mentioned, there may be centuries before a quasi-lexeme is able to shift from the initial to the final position of a compound, but in the absolute, and this is also Tournier’s position, a quasi-lexeme is defined as such, by its potential to be used initially or finally in a compound. If it does not have this potential, then it is likely to be restricted to the role of affix. That being said, I will not extrapolate by saying that a quasi-lexeme, which plays the role of modifier in a compound, can systematically become the head of that same compound. For example, an ‘anthropomorphist’ cannot possibly become a ‘morphanthropist’ under logical circumstances. The quasi-lexeme -morph- may lose its head position in a compound like ‘morphology’, but in its relation to the quasi-lexeme -anthrop-, -morph- is bound to be the head. I will delve into the issue of synthetic compounds in the next section, but I already feel compelled to say that the right-hand position for a quasi-lexeme in a compound does not imply that this quasi-lexeme should have the syntactic function of a head. The quasi-lexeme -anthrop- is no more a head in ‘misanthropist’ than it is in ‘anthropomorphist’.

To come back to Tournier’s constituent order constraints, a compound with quasi-lexemes should follow one of these three patterns: either its constituents have a fixed order (e.g. ‘brachycephaly’ cannot have its semiotic units switched into ‘cephalobrachy’, as the quasi-lexeme -brach- is always a modifier), or its constituents have a different order and therefore a different meaning (e.g. ‘pathology’ as the ‘study of abnormal mental condition’ may have its semiotic units switched into ‘logopathy’ defined as a ‘morbid affection of the speech’), or its constituents have a free order (e.g. ‘androgynous’ as a dvandva is a semantic equivalent to ‘gynandrous’). Nevertheless, I will admit that it is difficult to differentiate between constituents that have a fixed order and constituents whose order may be switched into a plausible, yet not lexicalized compound. Human imagination being unlimited, the lexicality of a compound is bound to prevail over its acceptability. For instance, the vernacular compound ‘hopbell’ could be a ‘toy in the shape of a bell with a power button that makes it leap when it is on’. Similarly, the fact that ‘philanthropist’ or ‘misanthropist’ refer to individuals who love and hate humanity respectively, why would we not break the logical circumstances, and conceive a ‘morphanthropist’ as a ‘divine creator who shapes humanity’? I will elucidate this point in the next section.

C. Primary versus synthetic compounds

Comparing quasi-lexemic compounds with vernacular compounds, we notice that both of them form two types of compounds: endocentric compounds, which have a head and a modifier, and exocentric compounds, which are devoid of any head or modifier. Furthermore, both types of compounds may be made up of three or more constituents. What differentiates them, is that vernacular compounds have elements that can be used separately and can be paraphrased (e.g. a 'toothache' is when a tooth aches), whereas compounds with quasi-lexemes do not have this property since their constituents are semiotic rather than lexical (e.g. an 'odontalgia' is not when an -odont- -alg-)[34].

Within his research on compounding, Hans Marchand (1969) contrasts primary compounds with synthetic compounds. He claims that primary compounds, which are made up of nominal constituents, are the 'same independent elements at the level of the underlying sentence' (p.18) (e.g. the steam operates the boat, hence 'steam boat')[35]. Conversely, synthetic compounds have a second morphological constituent, which forms a Subject-Predicate relation at the level of the underlying sentence (e.g. in watch-maker, 'maker' is decomposed into 'he makes'). Synthetic compounds, therefore, transpose a sentence with its syntactic relation and a semantic value of the component elements, whereas primary compounds contain 'implicit syntactic relations' and an unexpressed semantic element of the verb.

When looking at compounds with quasi-lexemes, the first question that may be raised is whether or not there is any pattern of primary and synthetic compound. In order to answer that question, I would like to examine quasi-lexemes in connection to their absence of lexical categories in English. Regardless of their position within a compound, that is to say, whether they are initial or final, head or modifier, etc., quasi-lexemes are morphosemantic constituents borrowed from classical languages, which means they have a derivational lineage in their original language. The semiotic unit -therap-, meaning 'heal', has a verbal form, *θεραπεύειν* 'to heal', from which derives the nominal form, *θεραπεία*, 'healing'. Thus, the semiotic unit -therap- may be devoid of any lexical category, yet it has been clearly derived from the category of verb into the category of noun in Greek. Such a derivational lineage is likely to determine, if not the lexical category of the element in English, at least the category of compound that this quasi-lexeme produces when it is the head of that compound. For example, the quasi-lexeme -cardi- from Greek *καρδία* 'heart' neither is a verb, nor does it derive from a verb in Greek. Therefore, the compound 'tachycardia' is bound to be a primary compound. In addition to this, the syntactic relation between the two constituents is implicit; the sentence is not entirely transposed in the compound, and there is an unexpressed semantic element of the verb (e.g. the heart **beats** fast). This causes an obvious semantic ambiguity between constituents, as 'tachycardia' could also be interpreted as 'the heart **makes** someone fast'. We will examine the variable semantic relations between constituents in Part III. B. In contrast with -cardi-, the quasi-lexeme -clas-, from the Greek noun *κλάσις* 'breaking', derives from the verb *κλάειν* 'to break'. Therefore, the compound 'osteoclasis' is bound to be a synthetic compound. Here the syntactic relation between the two constituents is explicit, the sentence is entirely transposed, and the verbal element and the predicate are in a overt form (e.g. the 'breaking of the bone(s)').

This derivational lineage of deverbal constituents producing synthetic compounds is not restricted to the quasi-lexemes -therap- and -clas-. The same phenomenon occurs with a whole set of lexical units: *φάγειν* 'to eat' becomes *φάγος* 'eating'; *κράτειν* 'to rule' becomes *κράτος* 'power'; *φόβειν* 'to put to fright' becomes *φόβος* 'fear', etc. The position I defend is that in spite of the fact that quasi-lexemes are no more than semiotic units devoid of any lexical category in English, their 'unfinished' structure being a finished structure in Greek or Latin should suffice to decide whether they form a primary or a synthetic compound. As for vernacular English suffixes, they are unable to change the original lexical category to which any quasi-lexeme belongs. For example, although 'psychotherapy' is a nominal compound, its quasi-lexeme -therap- still finds its origin in the Greek verb *θεραπεύειν*. Likewise, in the nominal compound 'fratricide', the quasi-lexeme -cid- derives from the Latin verb *caedere.* Therefore, both 'psychotherapy' and 'fratricide' are synthetic compounds, just like the vernacular compound 'shoe-maker' is. At this point, it is important to be aware of the fact that English suffixes can change the lexical category of a compound (e.g. from the noun 'photophobia' derives the adjective 'photophobic'), but nowise can they change the original lexical category of the semiotic unit. In other words, -phob- may have been derived into a noun in Greek, yet it is still a verb at the root; therefore, not only 'photophobia' and 'photophobic' are bound to be synthetic compounds, but also are all compounds that form a Subject-Predicate relation at the level of the underlying sentence, such as 'hydrophobia', 'scotophobia', etc. in which the semiotic unit -phob- is decomposed into 'one fears'.

As these examples show, vernacular suffixes are used in order to enable semiotic units to become lexical units, and also in order for compounds to shift across lexical categories. The synthetic compound 'physiotherapist' was already a synthetic compound when it was first produced as 'physiotherapy'. The suffix -ist has enabled the compound to be agentive, but the compound was predisposed to be agentive in its elementary structure /-physi- + -therap-/[36], simply because the semiotic unit -therap- derives from a verb and therefore is decomposed into 'one cures', whether the compound in its surface structure is 'physiotherapy' or 'physiotherapist'. The compounds 'fratricide' from Latin *frātricīda* as a 'person who kills a brother', and 'fratricide' from Latin *frātricīdium* as the 'action of killing one's brother' have the same application. Although they have been borrowed through French, both suffixes are the same in French, whether the compound refers to a person or to an action. What is important is that the semiotic unit -cid- should have the following derivational lineage in Latin: *caedere* becomes *-cida* or *caedere* becomes *-cidium*. Thus, any compound with the elementary structure /-fratr- + -cid-/ should be considered synthetic.

A synthetic compound is made up of what is commonly referred to as a set of arguments. As I mentioned, at the level of the underlying sentence, the deverbal constituent itself is decomposed into an implicit agent, which represents an external argument and a verb (e.g. -therap- 'to cure' = one cures). The element with which it concatenates is the internal argument. In the case of 'physiotherapy' and 'fratricide', the internal argument is the direct object of the deverbal constituent. However, for a deverbal constituent to have a direct object as the internal argument, it must be a transitive verb. Once again, I would argue that the answer to the question of verbal transitivity is to be found in the original language. For instance, -drom- comes from the Greek noun *δρομος* 'race', which derives from the verb *δραμειν* 'to race'. It is prone to make synthetic

compounds. The obstacle is that it is not transitive, and it cannot therefore have a direct object as its internal argument. For lack of a direct object, it can have a prepositional phrase. For example, /-hipp- + -drom-/ can be decomposed into 'one races **with** a horse'. Likewise /-aer- + -drom-/ can be decomposed into 'one races **in** the air'. Marchand claims that synthetic compounds are 'deverbal derivatives from verbs which form a direct syntagma with the determinant'. I would extend the definition, and postulate that synthetic compounds may form a direct or indirect syntagma with the determinant. In terms of semantic roles, the internal argument has the possibility of being a patient (e.g. physiotherapy), an instrument (e.g. hippodrome), a location (e.g. aerodrome), a manner (e.g. telegraphy), etc. We will find out with Rochelle Lieber (2004) in Part IV. C. that this particular issue is all the more relevant, since the 'distinctive thematic interpretations […] contribute to the interpretation of [the decomposed external argument]' (p.54).

Marchand remarks, interestingly, that in synthetic compounds the deverbal constituent is not always found in the final position, as the example 'pickpocket' testifies. 'Pickpocket' syntactically forms a Subject-Predicate relation that would be transcribed as 'one picks pockets'. Another characteristic is that when the deverbal constituent moves to the initial position and the internal argument moves to the final position, the compound is derived by means of a zero-morpheme (i.e. 'pick-**ø**-pocket' as opposed to 'pocket-pick**er**' or 'pocket-pick**ing**'). This unusual movement of deverbal constituent and internal argument in synthetic compounds also finds its application within compounds with quasi-lexemes, as the example 'philanthropist' testifies. In Greek, the noun *φίλος* 'love' derives from the verb *φίλειν* 'to love'; therefore, /-phil- + -anthrop-/ is decomposed into 'one loves mankind'. To revert to the question that was brought up in the last section, 'morphanthropist' as a 'divine creator who shapes humanity' is unacceptable, because -morph- from Greek *μορφή* 'form' does not derive from a verb, being nominal at the root. Therefore -anthrop- cannot possibly be the internal argument of -morph-. By contrast, 'misanthropist' has a deverbal element -mis- from Greek *μισειν* 'to hate'. It is a synthetic compound with a right-hand internal argument. The quasi-lexeme -mis- differs from its antonym -phil- in so far as it occurs only in the left-hand position of a compound. As for the suffixal derivative, as I discussed before, it is always attached to the right-hand constituent, and a reverse compound structure like /-mis- + -gyn-/ corroborates that norm. Thus, a synthetic compound with quasi-lexemes allows a mobility of deverbal constituent and internal argument but forbids a mobility of suffixes.

Eventually, there are quasi-lexemes deriving from Greek or Latin verbs that are used exclusively in the initial position of a compound. Here is a list of these quasi-lexemes collected from my corpus:

-alex- from Greek *ἀλέξειν* 'to ward off', -append-/-appendic- from Latin *appendere* 'to hang upon', -audi- from Latin *audīre* 'to hear', -aux-/-auxan- from Greek *αὔξειν* 'to increase', -cleid-/-cleist- from Greek *κλείειν* 'to close', -choan- from Greek *χειν* 'to pour', -dial- from Greek *διαλύειν* 'to separate', -dicty- from Greek *δικειν* 'to throw', -fiss- from Latin *findere* 'to cleave', -hapt- from Greek *ἅπτειν* 'to bind', -herpet- from Greek *ἕρπειν* 'to creep', -lip- from Greek *λείπειν* 'to be lacking', -men- from Greek *μένειν* 'to remain', -oryct- from Greek *ὀρύσσειν* 'to dig', -phenakist- from Greek *φενακίζειν* 'to deceive', -phlycten- from Greek *φλύζειν* 'to boil over', -phylact- from Greek *φυλάσσειν* 'to protect', -pict- from Latin *pingere* 'to paint', -piez- from Greek *πιέζειν* 'to squeeze', -pin- from

Greek *πίνειν* ‘to drink’, -plect- from Greek *πλέκειν* ‘to twist’, -prosth- from Greek *προστιθέναι* ‘to add’, -pseud- from Greek *ψευδειν* ‘to lie’, -ptych- from Greek *πτυσσειν* ‘to fold’, -sapr- from Greek *σέπειν* ‘to rot’, -stephan- from Greek *στέφειν* ‘to crown’, -tan- from Greek *τανύειν* ‘to stretch’, -terps- from Greek *τέρπειν* ‘to delight’, -thall- from Greek *θάλλειν* ‘to bloom’, -vibr- from Latin *vibrāre* ‘to vibrate’, -vide- from Latin *vidēre* ‘to see’, -ze- from Greek *ζειν* ‘to boil’.

These deverbal quasi-lexemes never govern the right-hand constituent. On the contrary, they happen to be subjected to the right-hand constituent, and their compound as a whole behaves as a primary compound in which the deverbal constituent has been adjectivized (e.g ‘saprophyte’ dissected into /-sapr- + -phyt-/ is rendered as ‘the plant is **rotten**’) or a synthetic compound in which the deverbal constituent has been nominalized (e.g. ‘herpetology’ dissected into /-herpet- + -log-/ is rendered as ‘one studies **reptiles**’).

To summarize this structural analysis, there are three major criteria that should confirm that compounds like ‘tachycardia’ and ‘saprophyte’ are primary compounds, while ‘osteoclasis’, ‘misogyny’ and ‘herpetology’ are synthetic compounds:

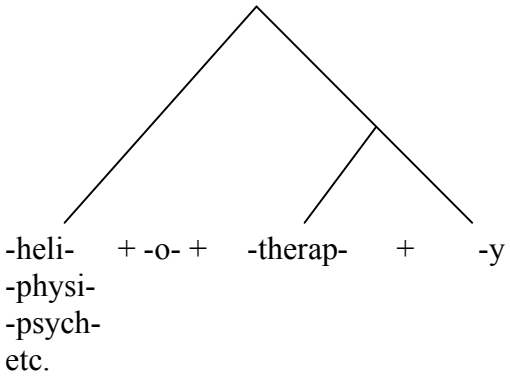
- A synthetic compound has a deverbal constituent made up of an implicit agent and a verb. A primary compound has a nominal constituent as a head, and it allows a deverbal constituent to be used as a modifier only if the latter has gone through a process of nominalization.

- A primary compound is always an endocentric compound, and its head is usually the right-hand constituent but not necessarily. A synthetic compound is usually the right-headed but occasionally the left-hand constituent is the head, and it has a direct or indirect internal argument.

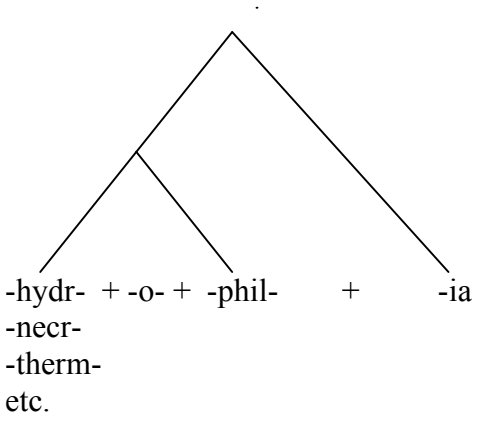
- A primary compound has an implicit syntactic relation of its constituents and allows more than one interpretation of the semantic relation. A synthetic compound has an explicit Subject-Predicate relation and can have its deverbal constituent decomposed in an unambiguous manner.

Another point to consider when dealing with neoclassical compounds, that is to say, compounds that are not borrowed from classical languages but rather produced within the borrowing language, is whether derivation or compounding occurs first. This is even more relevant, since there are derivatives that are made up of a semiotic unit and a suffix only (e.g. ‘therapy’). When considering the structure of a synthetic compound like ‘psychotherapy’ in contrast with ‘therapy’, we may ask ourselves whether ‘psychotherapy’ is the compounding of the semiotic unit -psych- and the lexical unit ‘therapy’, or if we are to consider that the semiotic units -psych- and -therap- are first concatenated and then derived according to the lexical category that needs to be ascribed to them (e.g. psychotherap-y, psychotherap-ic, psychotherap-ist, etc.). The answer to this question can be found through a systematic diachronic analysis. There is lexicographical

evidence, which consists in tracing the origin and the date of first occurrence of -therap- and its compounded derivatives. According to the OED, the derivative 'therapy' dates back to 1846[37], while all the synthetic compounds in which -therap- governs an internal argument (e.g. 'heliotherapy', 'physiotherapy', 'psychotherapy', etc.) are posterior productions. Compounds in which the quasi-lexeme -therap- governs an internal argument can, therefore, be represented by means of this tree structure:



By contrast, and again according to the OED, the semiotic unit -phil- enabled English to produce 'philia', which dates back to 1938. However, most common synthetic compounds in which the quasi-lexeme -phil- governs an internal argument were anterior to 1938. For example, 'hydrophilia' dates back to 1904, 'necrophilia' dates back to 1892, 'zoophilia' dates back to 1899, etc. Tournier (1985) talks about vertical conversion (or downgrading in this case), whereby a lexemic unit becomes a morphemic unit. I would object that the derivative 'philia' is more than a morpheme, since it is actually made up of two morphemes, namely, a quasi-lexeme and a suffix. However, I find it advisable to retain the concept of downgrading, since there is a process of conversion, yet without functional change between lexical categories. The derivative 'philia' stems from all other synthetic compounds in which -phil- governs an internal argument, just like the derivative 'ism' in 'I stand against all kinds of isms' stems from all other derived lexical units with the suffix -ism, such as fascism, nationalism, patriotism, etc., by a process of upgrading with a change of morphemic categories (morpheme > lexeme). Compounds in which the quasi-lexeme -phil- governs an internal argument can, therefore, be represented by means of this tree structure:



D. Secondary compounds

The use of tree structures, which is supported by lexicographical evidence, proves helpful, not only to highlight whether derivation or compounding occurs first, but also to determine, in the case of a secondary compound, which lexical units are concatenated first.

To begin with, I would like to emphasize the fact that, in spite of its vague label, a secondary compound is not strictly a primary compound onto which another lexical or semiotic unit has been added. For the sake of clarity, a secondary compound could have been labeled 'augmented compound', as its chief purpose is to compound that which is already a compound, with a third constituent. Hence, a synthetic compound to which a lexical or semiotic unit has been added could also fit in the category of secondary compound. A primary or synthetic compound has a binary structure, in so far as, aside from affixes, it involves two lexemes or two quasi-lexemes. A secondary compound has a ternary structure (e.g. **centr**al **nerv**ous **system, psych**o**physi**o**log**y). Theoretically, we could conceive of a tertiary compound that has a quaternary structure, a quaternary compound that has a quinary structure, etc. but there comes a point where the acceptability of the compounded formation supersedes its lexicality. Nevertheless, taking into consideration the fact that new constituents may always be concatenated to an already existing compound, the term 'augmented compound' seems advisable when speaking in general, and 'secondary compound', 'tertiary compound', etc. when speaking in particular.

Tournier (1985), in his thorough examination of the different types of compounds, suggests that secondary compounds should be divided into three types, corresponding to the order with which their constituents are concatenated:

- Type 1: W + XY (e.g. fairy godmother)
- Type 2: WX + Y (e.g. bedside table)
- Type 3: W + X + Y (e.g. round unvarnished tale)

Type 1 is by far the most common type of secondary compound with quasi-lexemes. This type pervades all scientific and technological fields. For example 'biology', which is already a concatenation of two semiotic units, namely, -bi- from Greek *βίος* 'life' and -log- from Greek *λέγειν* 'to speak', lends itself to secondary compounding by means of such semiotic units as -astr-, -phyt-, -xen-, etc., in 'astrobiology' as 'one speaks of life on the celestial bodies', 'phytobiology' as 'one speaks of vegetal life', 'xenobiology' as 'one speaks of extraterrestrial life', etc. In light of these examples, it is interesting to notice that all secondary compounds are subfields of 'biology', which behaves more like a simple lexical unit than a compound lexical unit at that point. Also, these secondary compounds have the characteristics of primary compounds, in so far as 'biology' as a non-deverbal constituent is the head, and -astr-, -phyt-, and -xen- are the respective modifiers. The type of compounds they form is endocentric, and the head is regularly the right-hand constituent. Lastly, there is an implicit syntactic relation between each constituent, which allows more than one

interpretation of the semantic relation. The type W + XY is corroborated by lexicographical data: 'biology' dates back to 1813, and all secondary compounds are posterior productions. Other than 'biology', many compounds take part in secondary compounding of type 1: photography (1839) > telephotography (1881); physiology (1564) > psychophysiology (1839); geography (1542) > paleogeography (1881), etc.

Type 2 is far less common than type 1, when it comes to compounding quasi-lexemes. The examples of secondary compounds of that type also tend to show that by the time a third constituent concatenates with the two others, that initial binary compound behaves more like a simple lexical unit than a compound lexical unit. For example, 'microbicide' does not have two semiotic units but three. However, by the time 'microbe' concatenates with the quasi-lexeme -cid-, it is hardly perceived as being of a binary structure, that is to say, -micr- from Greek *μικρός* 'small' and -b-[38] from Greek *βίος* 'life'. Instead, 'microbe', whose constituents are opacified, behaves like a simple lexical unit; therefore, the secondary compound 'microbicide' with the structure WX + Y is construed as 'Y is performed upon WX'. The same phenomenon occurs with 'philosophicide', although in this case, WX is more easily identifiable as being a concatenation of two distinct quasi-lexemes. Still, the latter example highlights an interesting fact that supports the theory of a semiotic rather than lexical nature of quasi-lexemes. This structure can also be construed as 'Y is performed upon WX'; however, WX is understood in its dissected form as /-phil- + -soph-/ rather than as a complete lexeme like 'philosophy', 'philosopher', 'philosophize', etc. Therefore, a 'philosophicide' may be understood as the killing of a person, a discipline, or a way of thinking, etc. This is further evidence that without a suffix, semiotic units are no more than signs that convey an incomplete lexical meaning.

More interestingly, as Tournier (1985) points out, there are binary compounds that are actually ellipsis of ternary compounds (e.g. gingernut < gingerbread nut). I would like to tackle the case of 'diplophobia', defined as the 'fear of double vision'[39]. Even though -dipl- could be considered a prefix rather than a quasi-lexeme, the compound 'diplopobia' is dissected as /-dipl- + -phob-/, which literally means 'fear of the double'. The discrepancy between the surface structure and the underlying sentence can be solved by stipulating that the binary compound 'diplophobia' is indeed an ellipsis of the ternary compound 'diplopophobia'. We end up with a secondary compound of type 2, that is to say, with a concatenation of the first two constituents, prior to adding the third constituent. The evidence for a structure WX + Y is that 'diplopia' was produced before 'diplophobia'. Once again, the semiotic units -dipl- and -op- are only signs, which, deprived of their suffix -ia, render an incomplete lexical meaning. Therefore, 'diplophobia' can be understood as the 'fear of being a victim of double vision' as well as the 'fear of the condition of having a double vision', the 'fear of a person who has a double vision', etc.

Type 3 is the least common type of secondary compound. Aside from highly scientific terms, this type of formation is mainly exemplified through nonce words that are created on the spur of the moment in order to satisfy a humorous impulse. They indubitably partake of creativity rather than productivity[40]. For example, while delivering a speech, Prince Philip of Edinburgh came up with the secondary compound

'dontopedalogy'[41], which was eventually lexicalized in 1969. Here is how he formulated the concept:

> *'**Dontopedalogy** is the science of opening your mouth and putting your foot in it, a science which I have practiced for a good many years'.*

There is evidence that we are dealing with a secondary compound of the type W + X + Y, that is to say, with the semiotic units -dont- + -ped- + -log- being concatenated synchronically. Firstly, there are no lexicalized compounds dontopedia, dontopedic, dontopedy, etc., nor are there lexicalized compounds pedalogy, pedalogue, pedalogic, etc. either in the OED, in the AHD or in the W3. Therefore 'dontopedalogy' must have been produced at once. Secondly, it is semantically obvious that every constituent needs to be coordinated with the other two. Unlike formations of type 1 and type 2, 'dontopedalogy' is not a subfield of 'pedalogy' and -log- is not acting upon -dontoped-. Instead, the secondary compound describes a 'so-called' science, which has two body parts interacting with each other.

Of all three types of compounds, type 1 and type 2 are the most predictable, as they are formed on a regular pattern.

Type 1: secondary compounds W + XY are always expanded primary compounds in which WXY is a hyponym of XY. The compound XY itself may be a primary or a synthetic compound, but stands necessarily as a nominal constituent.

Type 2: With secondary compounds WX + Y, the compound as a whole is an expanded synthetic compound. Even though WX may vary between primary and synthetic, it stands necessarily as a nominal constituent. As for Y, it is a deverbal constituent that governs the internal argument WX.

E. Expansion and transposition

Marchand (1969) states that a compound is the combination of constituents on the basis of a modifier and head relation, which he calls 'syntagma'. A syntagma is made possible because two distinct referents share something that causes them to be brought together. However, one referent being more prominent than the other (except when two referents are semantically coordinated), what ensues is that one referent will act upon the other and modify it. In that case, the relation between the head of the syntagma and the syntagma itself is that of hyponymy, since the syntagma becomes a variety of the head constituent. Lyons (1963) defines it in terms of 'unilateral implication' (p.69). For example, a 'doll house' is a 'house' but a 'house' is not necessarily a 'doll house'.

Regardless of its semantic restriction, the syntagma has the same lexical category and morphosyntactic features as its head constituent. Marchand refers to this phenomenon as an 'expansion' and maintains that any syntagma with a head constituent is by definition an expansion of that head constituent. This can be posited as follows:

$[XY]_z$ where X is a modifier and Y a head
Z is a hyponym of Y
Z is an expanded version of Y

The head of the compound being the prominent constituent that determines to which syntactic and lexical categories the compound as a whole belongs, there is an obvious problem with positing that Z is an expanded version of Y, when it comes to compounds with quasi-lexemes. Marchand further claims that an 'expansion is defined as a combination XY in which Y is a free morpheme' (p.11). I would like to complement the aforementioned principle with another condition:

For $[XY]_z$ to be an expansion of Y, Z should stem from Y
If not, Y is a reduced version of Z

For example, 'therapy' is a complete lexeme. In other words, it is a lexical unit made of a semiotic unit and a suffix. All compounds with 'therapy' as their head will be expansions of 'therapy'. However, the problem with compounds with quasi-lexemes is that Y may occasionally stem from Z, as the derivative 'philia' testifies. Therefore, 'philia', which is a complete lexeme dissected as /-phil- + -ia/, can be legitimately considered the head of the syntagma 'hydrophilia', but instead of dealing with expansion, we are facing a case of reduction. As these examples show, the syntagma is not required to be a primary compound. Synthetic compounds lend themselves to expansion as well as primary compounds do, and it is more important to trace which one, whether the head or the syntagma, was first lexicalized:

[psychotherapy] is a hyponym of [therapy]
[psychotherapy] stems from [therapy]
[psychotherapy] is an expanded version of [therapy]

[hydrophilia] is a hyponym of [philia]
[philia] stems from [hydrophilia], [zoophilia], etc.
[philia] is a reduced version of [hydrophilia], [zoophilia], etc.

The main hindrance with compounds with quasi-lexemes is that few of them have the potential to have their head constituent expanded (e.g. 'therapy' becomes 'psychotherapy') or to have their syntagma reduced (e.g. 'hydrophilia', 'zoophilia', etc. become 'philia'). The derivatives 'therapy' and 'philia' are lexical units, but the majority of non-compounded quasi-lexemes are simply semiotic units that have no access to discourse. The way to solve this problem is by dissecting the syntagma into semiotic units and applying the principle of 'expansion only'[42] to these semiotic units at the level of the elementary structure. For expansion to occur, the combination of semiotic units must satisfy two conditions, namely, to stand as a hyponym of the head constituent, and to stem from the head constituent:

/-psych- + -therap-/ is a hyponym of /-therap-/
/-psych- + -therap-/ stems from /-therap-/
/-psych- + -therap-/ is an expanded version of /-therap-/

In contrast:

/-pach- + -derm-/ is not a hyponym of /-derm-/
/-pach- + -derm-/ stems from /-derm-/
/-pach- + -derm-/ is NOT an expanded version of /-derm-/

Componential analyses of -therap-, as a simple semiotic unit and as a compound semiotic unit, should render the same results. Among the common semantic components are 'medical treatment', 'curative', 'intended to bring health to restoration', etc. Also, the 'IS A condition' mentioned by Allen (1978), according to which a compound should be a binary structure with a head and that head should be the right-hand constituent of the compound, is satisfied (e.g. /-hydr- + -therap-/ is a /-therap-/). The mere impediments are the lack of lexical category of the head constituent and its morphosyntactic limitation. Other than these, the semantic subset relation between the syntagma and its head constituent allows expansion to occur.

Although the representation of the elementary structure pays no attention to the lexical categories of constituents, we get an idea from the classical derivational lineage that /-psych- + -therap-/ is a synthetic compound, since -therap- is a deverbal noun, whereas /-pach- + -derm-/ is a primary compound, since -derm- originates from a noun. However, the less prominent constituent in a syntagma, which is the internal argument in the case of a synthetic compound or the modifier in the case of a primary compound, is often overlooked. Yet any syntactic change in relation to the non-head constituent is bound to have semantic implications. Marchand affirms that in a primary compound, the head is a noun, and the modifier is naturally an adjective[43]. Similarly, in a synthetic compound, the governing constituent is a deverbal noun, and the internal argument is naturally a noun. The modifier constituent of a primary compound, which would be used in a different function than adjective, has clearly undergone transposition. This can be posited as follows:

In a primary compound Z, if X is a noun, then it has been transposed
$[X_{adjective} + Y_{noun}]_z \rightarrow [X_{noun\ 2} + Y_{noun\ 1}]_z$

The vast majority of primary compounds with quasi-lexemes have an adjectival modifier. For example, the syntagmas with the semiotic unit -b- from Greek *βίος* 'life' as their head constituent are /-sapr- + -b-/, /-micr- + -b-/, etc. Most of them have their modifier constituent in a natural function. Yet the case of /-hyl- + -b-/, which is realized as 'hylobian', from Greek *ὕλη* 'forest', testifies that a transposition of the modifier has taken place. Likewise, the syntagmas with the semiotic unit /-card-/ from Greek *καρδία* 'heart' as their head constituent are /-brad- + -card-/, /-orth- + -card-/, /-sten- + -card-/, etc. However, the case of /-trich- + -card-/, which is realized as 'trichocardia', from Greek *θρίξ, τριχός* 'hair', also testifies to a transposition of the modifier.

Transposition is not strictly limited to the passage from adjective to noun. Having addressed the issue of nominalized verbs in section C., I may argue that all deverbal constituents that have been nominalized and stand as modifiers in a primary or synthetic compound are equally transposed. For example, the quasi-lexeme -herp-, from Greek *ἕρπειν* 'to creep', which is found in 'herpetology', gives evidence of a transposition from verb to noun.

Interestingly, Marchand points out that transposition is an essential factor to the increase of productivity in compounding. What he suggests is that 'the more a pattern has a transpositional function, the higher is the degree of its productivity' (p.18). In addition to this, although I will address the issue of relational ambiguity between constituents in Part III. B.1, it is important to mention here that transposition is what increases relational ambiguity. It does not mean that a primary compound whose modifier constituent is an adjective is unambiguous, but that the transposition from an adjective to a noun makes the compound more ambiguous, as the possible semantic relations between the two constituents increase. For example, the vernacular compound 'wet bed' is a primary compound whose modifier constituent is an adjective. There is a lexical ambiguity in the constituent 'wet', which may refer to urine or to any other liquid that could have been spilled or poured on the bed. However, the relational ambiguity between the modifier and the head constituents is minimal. In contrast, the compound 'water bed', whose modifier constituent is a transposed noun, has a more ambiguous relation to its head constituent, since the bed could be made of water, or it could attract water, or it could be located near water, etc. Compounds with quasi-lexemes do not seem to be influenced by transpositional factors when it comes to increasing relational ambiguity between their constituents. On the contrary, a transposed compound usually demonstrates a solid degree of relational predictability.

The next Part is intended to shed light on the semantic relations between constituents in compounds with quasi-lexemes. I will prove that, in spite of a more restricted means of productivity, compounds with quasi-lexemes are nonetheless prone to resort to a variety of derivational and metasemous processes.

PART III. COMPOUNDING QUASI-LEXEMES: SEMANTIC RELATIONS

A. Compounds versus derivatives[44]

Marchand describes derivation as the transposition of a lexeme to the role of modifier in a syntagma in which the head is a dependent morpheme. If I applied his definition to the lexeme 'dentist' and compare it with 'dentiroster'[45], which is defined as 'belonging to an ornithological species that has a toothed beak', I would infer that, although both formations have the quasi-lexeme -dent- in a transposed function, in 'dentiroster', -rostr- is a quasi-lexeme. The interpretation I can make of this compound lexical unit is this:

/-dent- + -rostr-/ is not a hyponym of /-rostr-/
/-dent- + -rostr-/ stems from /-rostr-/
/-dent- + -rostr-/ is NOT an expanded version of /-rostr-/

Conversely, with the assumption that an affix may be the head of a formation, 'dentist' has a categorizing suffix as its head constituent:

/-dent- + -ist-/ is a hyponym of /-ist-/
/-dent- + -ist-/ does not stem from /-ist-/
/-dent- + -ist-/ is NOT an expanded version of /-ist-/

In the latter example, because the head constituent belongs to the morphemic category of affix, the lexeme becomes a derivative. As for the former example, which is commonly referred to as an 'exocentric compound', it cannot really be a compound either, since it fails to pass the test of expansion. Marchand's argument is this:

If a formation $[XY]_z$ cannot be explained by Y determined by X, but as a person or a thing having Z, then it is not a compound but a derivative.

From that statement, I may deduce that all so-called 'bahuvrihi compounds' are indeed no more than derivatives. Nevertheless, there is a distinction between the derivatives 'dentist' and 'dentiroster'. In 'dentist', if I take for granted the fact that -ist- is the head of the formation, in spite of its 'lesser' morphemic category, then I conclude that /-dent- + -ist-/ is a kind of /-ist-/. In contrast, 'dentiroster' is assumed to be devoid of a head, at least at the level of the morphological structure. I have argued earlier that in such compounds, the head exists, but it is implicit. Thus, /-dent- + -rostr-/ is not a kind of /-rostr-/ but a bird that is characterized by /-dent- + -rostr-/. From these two examples, I gather that there is not one but two varieties of derivatives: one is simple, and the other is complex.

- Simple derivatives

Amiot and Dal (2007) claim that the quasi-lexeme -log-, as found in French *psychologue* or English 'psychologist', forms compounds that receive an 'agentive interpretation' (p.333). Thus, a 'psychologist' is a 'person who speaks about the spirit'. They also clearly acknowledge the elementary structure in *psychologue*, in which -psych- stems from the noun *ψύχη* 'spirit' and -log- from the verb *λέγειν* 'to speak', but they contend that this underlying sentence is not as readily discernable as it is in a formation like 'floriferous'. However, according to them, the surface structure is different from the underlying sentence, and it opens up two hypotheses as to what the status of -logue is:

  - Hypothesis 1: It is a deverbal noun that has undergone a change of meaning from 'speaker' to 'specialist'. Therefore, the compounds it forms are primary compounds of the type $[X_{\text{noun 2}} + Y_{\text{noun 1}}]_Z$ with a transposition of the modifier.

  - Hypothesis 2: It is an exponent of an LCR[46], or in other words, an affix, that forms nouns of specialists, just like the suffix -ist- does. At this point, we may infer that the two suffixes are in complementary distribution.

Although the first hypothesis is the more plausible, I would still argue that /-psych- + -log-/ is a synthetic compound, whose deverbal constituent has an opaque function in comparison with such synthetic compounds as /-reg- + -cid-/ or /-copr- + -phag-/. The quasi-lexeme -log- has undergone a metonymical change from 'one speaks' to 'one studies' and every constituent with which it concatenates is a direct internal argument (e.g. /-psych- + -log-/ is glossed as 'one studies the spirit'). As for the second hypothesis, the only supportive argument is the fact that the quasi-lexeme -log-, as found in 'psychology', occurs only in final position, a characteristic shared by exponents of LCRs. The main refuting argument is that there are compound lexical units like French *ophtalmologiste* or English 'ophtalmologist' that bear both suffixes -log- and -ist-. Two suffixes with identical semantic components cannot possibly be used in the same lexeme. The argument I have defended is that a compound with quasi-lexemes or a derivative with a quasi-lexeme ought to be firstly dissected into its minimal units of meaning. The element -logue is not a minimal unit of meaning, but a semiotic unit and an agentive suffix. Once dissected into /-psych- + -log-/, suffixes may be used to enable the interpreter to complement the underlying sentence, while preserving the basic syntactic relation (e.g. 'psycholog**ist**' is a '**person who** studies the spirit', 'psycholog**y**' is a '**discipline which** studies the spirit', 'psycholog**ical**' is a '**relation to that which** studies the spirit', etc.).

The issue raised by Marchand concerning the headedness of an exponent of an LCR is crucial when it comes to understanding a syntagma like 'psychologist', which is formed by concatenating two quasi-lexemes and adding the agentive suffix -ist-. At the level of the morphological structure, a 'psychologist' is not a '*logist' in the same way that a 'psychotherapist' is a 'therapist'. But at the level of the elementary structure, both are represented in a similar way:

/-therap- + -ist-/ is a hyponym of /-ist-/
/-therap- + -ist-/ does not stem from /-ist-/
/-therap- + -ist-/ is NOT an expanded version of /-ist-/

/-log- + -ist-/ is a hyponym of /-ist-/
/-log- + -ist-/ does not stem from /-ist-/
/-log- + -ist-/ is NOT an expanded version of /-ist-/

What we deduce is that, if neither /-therap- + -ist-/ nor /-log- + -ist-/ is an expanded version of /-ist-/, then they are not compounds, since compounding implies expansion. However, the question of headedness is not excluded, since a head does not have to expand; therefore, a suffix may fulfill the function of a head as long as it is the dominant element in the lexeme. Marchand supports that perspective by claiming that in a suffixal derivative, the suffix is the semantically and syntactically dominant element. Hence, we may stretch our representation of the elementary structure as follows:

/-log- + -ist-/ is the head of the compound /-psych- + -log- + -ist-/[47]

But also:

/-ist-/ is the head of the derivative /-log- + -ist-/

- Complex derivatives

With simple derivatives, the head constituent, being a suffix, is of a different morphemic category than with compounds. In contrast, with complex derivatives, commonly referred to as 'exocentric compounds', it is commonly argued that the head is outside of the syntagma. For example, a 'pachyderm' is a mammal that is characterized by /-pach- + -derm-/ and rendered as a 'mammal that **has** thick skin'. Likewise, an 'oligochaete', from the Greek *ὀλίγος* 'few' and *χαίτη* 'bristle', is a variety of worm that is characterized by /-olig- + -chaet-/ and rendered as a 'worm that **has** few bristles'[48]. If such is the case, then a suffix should have the strict function of assigning a lexical category to its syntagma, but nowise would it serve as the head of that syntagma. However, the position I defend is that, contrary to compounds like /-psych- + -log- + -ist-/, whose head constituent /-log- + -ist-/ is made up of a semiotic unit and a suffix, complex derivatives do have, at the level of the morphological structure, a head constituent that is made up of a suffix only. That head constituent also determines the lexical category of the syntagma and may be reduced to a zero-morpheme[49]:

/-e/ is the head of the complex derivative /-olig- + -chaet- + -e/

But also:

/-ø/ is the head of the complex derivative /-pach- + -derm- + -ø/

The supportive argument for considering the head of these complex derivatives to be present at the level of the morphological structure is this: quasi-lexemes are bound elements under the law of affix requirement; therefore, not only is a suffix obligatorily attached to the right-hand constituent of any such complex derivative in order to determine the syntactic and lexical categories to which that derivative belongs, but also that suffix is the semantically and syntactically dominant element of the syntagma. The main difference between a complex derivative and a compound is that the head constituent in a complex derivative is not agentive, because it does not form a Subject-Predicate relation. Instead, it is thematic. For example, on the one hand, 'psychotherapist' is rendered as a 'person **heals** the spirit'; on the other hand, 'pachyderm' is rendered as a 'mammal **has** thick skin'. The compound 'psychotherapist' has a dynamic verbal structure. The suffix /-ist-/ stands for the agent at the level of the surface structure, but it is agentive even in the underlying sentence, since /-therap-/ is glossed as 'one heals'. Conversely, the complex derivative 'pachyderm' has an implicit syntactic relation between its constituents and a stative verbal structure. The suffix, which is a zero-morpheme, stands as the theme at the level of the morphological structure, exactly like the morpheme /-e/ does in 'oligochaete'. It must be said that the same morpheme /-e/ may be agentive in a compound (e.g. zoophil**e**) or thematic in a complex derivative (e.g. oligochaet**e**). Yet that morpheme is the head constituent in /-olig- + -chaet- + -e/ but not in /-zo- + -phil- + -e/, in which the head constituent is /-phil- + -e/.

Therefore, the vast majority of so-called primary compounds with quasi-lexemes would be merely complex derivatives. The particularity of a complex derivative with quasi-lexemes is that because the head is the theme actualized by a suffix, the concatenated semiotic units become automatically the qualifier. Here is how it may be represented:

In a complex derivative [X + Y + Suffix]
Suffix is the head
and [X + Y] is the qualifier

The difference between a modifier and a qualifier is threefold:

- A modifier belongs to a compound. A qualifier belongs to a complex derivative.

- A modifier is made up of one semiotic unit, except in the case of augmented compounds. A qualifier is made up of a minimum of two semiotic units.

- A modifier is irreducible to further syntactic components. A qualifier is made up of a head and a modifier that have a primal[50] syntactic function.

The issue of transposition tackled in Part II. E. is a common phenomenon with complex derivatives. For example, 'mastodon' from the Greek *μαστός* 'breast' and *ὀδούς, ὀδόντος* 'tooth' is a complex derivative with a head /-ø/ and a qualifier /-mast- + -odon-/. Although the lexeme /-mast- + -odon- + -ø/ refers to a 'prehistoric mammal that had

breast-like tubercles on its posterior teeth', the qualifier is reducible to a head constituent /-odon-/, which is itself modified by /-mast-/. As opposed to /-pach- + -derm-/, whose modifier /-pach-/ derives from the Greek adjective *παχύς*, /-mast- + -odon-/ has a modifier /-mast-/ that has been transposed. Another interesting case of transposition is the complex derivative 'hippopotamus', from Greek *ἵππος* 'horse' and *ποταμός* 'river'. The head constituent is the neo-Latin case inflection /-us/, which has substituted for the Greek first declension nominal /-oς/. The qualifier is /-hipp- + -potam-/. Interestingly, the head of this qualifier is the left-hand constituent. In addition, the lexeme as a whole is not rendered as a 'mammal that **has** a river-horse', but as a 'mammal that looks like a river-horse'. Consequently, it would be appropriate to refine Marchand's definition of a complex derivative:

> If a formation [(X + Y) + Suffix] cannot be explained by Y determined by X, but as Suffix being linked to X + Y, then it is not a compound but a complex derivative stretched as $[(X + Y)_{qualifier} + (Suffix)_{head}]$

The theory according to which the head of any complex derivative is present at the level of the morphological structure has flaws too. For instance, the syntagma 'onager', from Greek *ὄνος* 'ass' and *ἄγριος* 'wild', creates an obvious problem in terms of syntactic structure. This primary compound is not a complex derivative, since the head is the non-deverbal semiotic unit /-on-/. Not only does the head occur as the left-hand constituent, but the compound has a suffix /-er/, which cannot possibly be thematic. Contrary to synthetic compounds, which can be explained in terms of discontinuous morphemes or 'split heads' (e.g. /-phil- + -er/ is the head of the compound /-phil- + -soph- + -er/), 'onager' does not have a deverbal constituent bound to its suffix /-er/ in order to form a head. Therefore, the suffix /-er/ cannot be a head, unless /-on-/ and /-er/ are co-referents. I will try to elucidate this issue through Lieber's principle of coindexation in Part IV. C.

B. Variable relations

So far, I have applied the word 'compound' *lato sensu*, that is to say, to refer to either a compound *stricto sensu* or to what I would call a 'fortuitous collocation'. However, the difference between a compound *stricto sensu* and a fortuitous collocation is notable, when it comes to understanding how syntagmas with quasi-lexemes function. A fortuitous collocation is not a lexicalized syntagma. This is why context may determine what its actual referent is. In contrast, a compound *stricto sensu*, which may or may not originate as a fortuitous collocation, is a lexicalized syntagma with an established referent[51]. As I mentioned earlier, a 'water bed' is a bed that may be interpreted as having various relations to the water. At this point, it is considered a fortuitous collocation. Conversely, a 'waterbed', as a 'bed made of a mattress filled with water', is a compound with an entry form in dictionaries. As it is often the case with vernacular compounds, the constituents of a compound *stricto sensu* may be tied, hyphenated, or spaced. However, the constituents of a fortuitous collocation are always spaced. As for syntagmas with quasi-lexemes, because their constituents are neither spaced nor hyphenated but tied, they

cannot behave like fortuitous collocations do. Nevertheless, I would like to look at them in such a way that I may determine a possible pattern in the semantic relations between their constituents. In order to do so, it is necessary to address the issues of relational and lexical ambiguities.

1. Relational ambiguity

Margaret Allen (1978) understands compounds as being syntactic structures with variable relations between their constituents. She refers to that phenomenon as the 'Variable R Condition'. As I have already pointed out, it is evident that synthetic compounds, with their Subject-Predicate relation at the level of the underlying sentence, are not concerned with such a principle, since they form explicit syntagmas. This Variable R Condition is intended to determine the meaning of primary compounds. In other words, a primary compound with a modifier adjective and a head noun (e.g. dusty snow) or with a noun that has been transposed as modifier and a head noun (e.g. toy factory), may be inherently ambiguous. Only context will clarify its meaning. In light of these examples, we notice that although each constituent has an explicit referential content, its syntagmas have implicit syntactic relations, which blur the unexpressed semantic element of the verb (e.g. the factory **makes** toys vs. the factory **is** a toy). Allen (1978) claims that the range of possible meanings for a given primary compound should be specified in terms of the semantic features of each constituent: 'Variable R predicts that the complete semantic content of the first constituent element may fill any one of the available feature slots in the feature hierarchy of the second constituent element, as long as the feature slot to be filled corresponds to one of the features of the filler' (p.93). For example, a 'lithophyte', from Greek *λίθος* 'stone' and *φυτόν* 'plant', has the following possible range of meanings:

the plant **lives on** stones
the plant **looks like** stone
the plant **shuns** stones
*the plant **speaks to** stones
etc.

Allen indicates that the dominant[52] feature slots are more likely to be filled. In contrast, 'impossible meanings result from incompatibilities between two sets of features' (p.10). Therefore 'lithophyte' rendered as 'the plant **speaks to** stones' is ruled out, since it does not correspond to the semantic features of either the first or the second constituent element.

As has been shown in the previous section, the vast majority of syntagmas with quasi-lexemes are either synthetic compounds or complex derivatives. Examples like 'lithophyte', with a non-deverbal semiotic unit, which, attached to the morpheme /-e/, stands as the head constituent of the syntagma, are rather uncommon cases of primary compounds. Therefore, in the absence of a large corpus of primary compounds, I suggest dealing with the qualifiers of complex derivatives as we would with a compound, taking into consideration that a qualifier contains a modifier[53] and a head that have a primal

syntactic function. For example, although 'hippopotamus' is a complex derivative, with the morpheme /-us/ as its head constituent, the qualifier /-hipp- + -potam-/ is made up of a head constituent /-hipp-/, which is modified by the element /-potam-/. As such, Allen's Variable R Condition may be applied:

the horse **lives in** rivers
the horse **delights in** rivers
the horse **avoids** rivers
etc.

Warren (1988) examines the 'connecting links' between constituents in primary compounds made up of an adjectival modifier – that is to say, a constituent that has not been transposed – and a nominal head, and she subsequently establishes a set of tests based on linguistic and extralinguistic knowledge, each one being subdivided into general and specific knowledge. Typical connecting links between modifier (X) and head (Y) are explicit verbal phrases such as (Y) constituting (X), (Y) being in accordance with (X), (Y) being like (X), (Y) having (X), (Y) experiencing (X), (Y) manifesting (X), (Y) containing (X), (Y) dealing with (X), (Y) causing (X), (Y) resembling (X), (Y) being for (X), etc. She maintains that 'it is possible to suggest several connecting links for one and the same adjective' (p.123). I would like to summarize each step of her analysis using the qualifier 'pachyderm':

- Linguistic Knowledge

General knowledge

The syntagma 'pachyderm' is identified as being made up of an adjective *παχύς* and a noun *δέρμα*.

(i) the head /-derm-/ of the qualifier /-pach- + -derm-/ is the referring unit.
(ii) the head /-derm-/ can be determined by its right-hand position.
(iii) the modifier /-pach-/ characterizes the head /-derm-/.
(iv) the modifier /-pach-/ is a characterizer.
(v) the connecting link between the head (Y) and the modifier (X) is (Y) characterized by (X).

Specific knowledge

The interpreter's mental lexicon should include /-pach-/ and /-derm-/.

(i) the modifier /-pach-/ has the meaning 'thick'; the head /-derm-/ has the meaning 'skin'.

- Extralinguistic Knowledge

General knowledge of the world

The interpreter should have some encyclopedic knowledge of *δέρμα* 'skin' and *παχύς* 'thick', and he should be able to select them when the situation is relevant.

(i) /-pach-/ is not an integral part of /-derm-/, thus (Y) having (X) is ruled out.
(ii) /-pach-/ is not a place of /-derm-/, thus (Y) occurring in (X) is ruled out.

(iii) /-pach-/ is not the origin of /-derm-/, thus (Y) deriving from (X) is ruled out.
(iv) /-pach-/ is not the cause of /-derm-/, thus (Y) caused by (X) is ruled out.
(v) /-pach-/ is not the goal of /-derm-/, thus (Y) is for (X) is ruled out.

Specific knowledge
The interpreter will access only the relevant facts related to the situation.
(i) /-derm-/ has a certain appearance related to texture, color, softness, etc. /-pach-/ characterizes something through sensory power. Therefore, of all the possible connecting links, '**characterized by**' is the most plausible one.

With a nominal modifier, that is to say, a constituent that has been transposed, the relational ambiguity of the qualifier tends to increase significantly. Therefore, the more extralinguistic knowledge of the world the interpreter has, the more likely is he to infer the accurate connecting link. Should we analyze the qualifier 'hippopotamus' through Warren's set of tests, we would end up with this:

- Linguistic Knowledge

General knowledge
The syntagma 'hippopotamus' is identified as being made up of a noun *ἵππος* and a noun *ποταμός*.
(i) the head /-hipp-/ of the qualifier /-hipp- + -potam-/ is the referring unit.
(ii) the head /-hipp-/ can be determined by its left-hand position.
(iii) the modifier /-potam-/ identifies the head /-hipp-/.
(iv) the modifier /-potam-/ is an identifier.
(v) the connecting link between the modifier (Y) and the head (X) is (X) identified by (Y).

Specific knowledge
The interpreter's mental lexicon should include /-hipp-/ and /-potam-/.
(i) the modifier /-potam-/ has the meaning 'river'; the head /-hipp-/ has the meaning 'horse'.

- Extralinguistic Knowledge

General knowledge of the world
The interpreter should likewise have some encyclopedic knowledge of *ἵππος* 'horse' and *ποταμός* 'river' and he should be able to select them when the situation is relevant.
(i) /-potam-/ is not an integral part of /-hipp-/, thus (X) having (Y) is ruled out.
(ii) /-potam-/ may be the origin of /-hipp-/, thus (X) coming from (Y) is plausible.
(iii) /-potam-/ is not the cause of /-hipp-/, thus (X) caused by (Y) is ruled out.
(iv) /-potam-/ is not the goal of /-hipp-/, thus (X) is for (Y) is ruled out.
(v) /-potam-/ may be the habitat of /-hipp-/, thus (X) living by (Y) is plausible.

Specific knowledge
The interpreter will access only the relevant facts related to the situation.
(i) /-hipp-/ is part of a zoological family that is connected to nature, etc.
/-potam-/ is an important part of nature where animals freshen up. Therefore, of all the possible connecting links, '**living by**' is the most plausible one.

As long as the modifier is an adjective, the connecting link is restricted to the meaning '**characterized by**'. For example 'tachycardia', from Greek *ταχύς* 'fast' and *καρδία* 'heart', may be glossed as /-tach- + -card-/ is /-card-/ that is characterized by /-tach-/. Likewise, 'leiotrichy', from Greek *λεῖος* 'smooth' and *θρίξ, τριχός* 'hair', may be glossed as /-lei- + -trich-/ is /-trich-/ that is characterized by /-lei-/. When the modifier is a noun, the number of connecting links is claimed to be unlimited. However, Warren makes the point that connecting links are represented by a limited set[54]. Either these links are opaque, and a specific knowledge is required, or they are transparent, and this knowledge is superfluous. In addition to this, a linguistic knowledge ought to be accompanied by an extralinguistic knowledge. For example, /-mast- + -odon-/ requires an extralinguistic knowledge, that is to say, one needs to examine how /-mast-/ and /-odon-/ are related to each other before inferring an accurate connecting link. By observing the mammal's fossil molars, whose crowns are shaped like nipples, one may gloss that /-mast- + -odon-/ is /-odon-/ that resembles /-mast-/. The connecting link between the head and the modifier may be inferred as '**resembling**'. Therefore, the linguistic knowledge that /-mast-/ and /-odon-/ are semantically equivalent to 'breast' and 'tooth' respectively is not enough. When the linguistic knowledge does not suffice to infer the link, the extralinguistic knowledge should clarify any doubt.

Ultimately, relational ambiguity may be extended to synthetic compounds. For example, 'lithography', from Greek *λίθος* 'stone' and *γράφειν* 'to write', as found in various places of literature, has different meanings because of different connecting links between the constituents, and each of these meanings may be inferred only in context. We know for a fact that a geologist does not deal with 'lithography' in the same way that an artist does. The former studies stones, whereas the latter uses them. In the case of a geologist, 'lithography' may be glossed as /-lith- + -graph-/ is /-graph-/ about /-lith-/. The internal argument is the topic of the action expressed by the deverbal constituent. By contrast, for an artist, 'lithography' may be glossed as /-lith- + -graph-/ is /-graph-/ on /-lith-/. The internal argument is the place of the action expressed by the deverbal constituent. This synthetic compound is also liable to be found with different meanings and a similar connecting link but different referential contents of the internal argument, as 'lithography' in the context of jewelry testifies. In the case of a jeweler, 'lithography' may be glossed as /-lith- + -graph-/ is /-graph-/ on /-lith-/. The connecting link for the jeweler's 'lithography' is in no way different from the connecting link for the artist's 'lithography'. However, the referential contents of the internal arguments differ, in so far as each individual deals with different kinds of stones. In the next section, I will attempt to clarify the issue of referential content and lexical ambiguity.

2. Lexical ambiguity

Warren (1988) suggests that with relational ambiguity, although there may be a variety of connecting links between the modifier and the head, the referential content of the modifier remains fixed. The hypothesis she makes is that the variability of connecting links may cause polysemy of the modifier, which will ultimately cause relational ambiguity between the modifier and the head. When it comes to lexical ambiguity, it is the referential content of the modifier that is variable. This referential content is inexorably subjected to a contextual ambiguity. The example given by Warren is the adjective 'round', which in the context of the shape of an eye, moves its referential boundary to become 'somewhat oval'. As we are about to find out, semiotic units are similar to lexical units with regard to their referential complexity. A semiotic unit like /-cen-/ can mean both 'new' and 'empty'. Similarly, /-brad-/ can mean 'slow' or 'dull'. Once again, linguistic and extralinguistic knowledge should help the interpreter infer the accurate meaning.

Before proceeding any further, I would like to make a distinction between homonymy, whose ambiguity requires that the interpreter have a linguistic knowledge of the lexeme (or quasi-lexeme) and be able to differentiate its meaning with another unrelated meaning, and polysemy, whose ambiguity requires that the interpreter be able to relate the meaning of a lexeme (or quasi-lexeme) with another meaning.

- Homynymy

Homynymy is a common phenomenon of morphemic similarity that is purely coincidental. It consists in having two or more referents that have the same signifier due to a diachronic convergence of morphemes. For example, the Latin *manus* 'hand' and the Greek *μανία* 'madness' have converged into a single signifier /-man-/. Therefore /-man-/ is represented semantically as two distinct quasi-lexemes in 'quadri**man**e' and 'mono**man**e'. There is no relation between the two meanings, as they both have different etymons. Another example is /-cen-/, which has two Greek etymons distinct from each other. On the one hand, *καινός* means 'new' and has a variant quasi-lexeme /-cain-/. On the other hand, *κενός* means 'empty' and has a variant quasi-lexeme /-ken-/. The two distinct Greek elements have fused into a single signifier /-cen-/, as found in '**cen**ozoic' and '**cen**otaphic'. More interestingly, it is possible for two homonymous quasi-lexemes to have two etymons that are also homonymous. An example is the Greek lexical unit *ὠμος*, which means both 'shoulder' in '**om**oplate' and 'raw' in '**om**ophagist'.

The main difficulty when dealing with two meanings of the same lexical unit is to be able to trace them far enough diachronically to discern whether one meaning stems from the other meaning, or if they are unrelated. For example, the quasi-lexeme /-carp-/, from Greek *καρπός*, means both 'fruit' in '**carp**ology' and 'wrist' in '**carp**ectomy'. It is commonly argued that the two meanings are related by a metonymical link, because the joint of the wrist enables one to pick fruit. However, this is not accurate. The two *καρπός* are completely unrelated. The first one, meaning 'fruit', is actually a cognate of the Latin verb *capere* 'to pick', and the second one, meaning 'wrist', has a different etymon and subsequently becomes the Latin *carpus.*

Lexical ambiguity tends to be lesser with homonyms, as both meanings are usually far apart, which makes the interpretation of the syntagma rather straightforward. The closer the meanings are, the more likely are we to be dealing with polysemy.

- Polysemy

I will devote the next section to the process of semantic change in all its varieties. But for the time being, the issue of polysemy leads me to think of it synchronically as an *état de langue* or 'language state', whereby one signifier has two or more referents that are semantically related. For example, although *ὠμος* 'raw' is a homonym of *ὠμος* 'shoulder', there is yet another meaning of *ὠμος*, as found in 'omophron', which is neither 'raw' nor 'shoulder', but 'cruel'. There is, in fact, a direct semantic relation between *ὠμος* 'raw' and *ὠμος* 'cruel', in so far as an 'omophron' – literally 'that has cruel tendancies' – is a carnivorous insect that lives on larvae, or, in other words, on raw organic matter.

Warren's concept of shifting the referential boundary of the constituent is important to understand that all cases of polysemy are born of a semantic mutation. Nevertheless, the degree to which this mutation operates is variable. The quasi-lexeme /-calypt-/, as found in 'calyptoblastic', stems from Greek *καλυπτός* 'covered'. The referential boundary of this quasi-lexeme tends to shift from 'covered' to 'hidden', to the extent that it is somewhat difficult to infer an accurate meaning of /-calypt-/.

Polysemy can apply to the head or modifier of a primary compound, or the head or modifier of a qualifier when the syntagma is a complex derivative. Polysemy may also apply to the deverbal constituent or internal argument of a synthetic compound.

With primary compounds, the lexical ambiguity may be unsubstantial. For instance, in 'lithophyte', the referent of either the head or the transposed modifier may be restricted to a particular kind of /-lith-/ or a particular kind of /-phyt-/. There are indeed plants that would not grow on certain stones or rocks, depending on the stone's size, texture, ease to get a good grip on, etc. Likewise, the plant itself may be limited to a species or a genus, which makes it difficult to infer the exact nature of the syntagma. Another instance is 'coprolite', from Greek *κόπρος* 'excrement' and *λίθος* 'stone', in which the modifier may shift its referential boundary from the organic matter of animate beings to the superfluous matter expelled by plants.

With complex derivatives, the lexical ambiguity between the constituents of the qualifier is a degree higher. If we take 'pachyderm', not only is the head /-derm-/ semantically extended to the epidermis and the hypodermis alike, but the modifier /-pach-/ also tends to shift its referential boundary from 'thick' to 'hard'. As for 'gymanthous', from Greek *γυμνός* 'naked' and *ἄνθος* 'flower', the referential boundary of the modifier tends to shift from 'naked' to 'deprived of calyx and corolla'. Eventually, the transposed modifier of a qualifier in a complex derivative may be similarly affected by lexical ambiguity. Thus, 'acrocephaly', from Greek *ἄκρον* 'extremity' and *κεφαλή* 'head', is problematic, not only because /-cephal-/ tends to imply 'skull', but also because /-acr-/ shifts its referential boundary from 'extremity' to 'height'.

With synthetic compounds, the lexical ambiguity is usually the most significant. For example, in 'bradypepsia', from Greek *βραδύς* 'slow' and *πέπτειν* 'to digest', the internal argument, which has gone through a process of nominalization, implies 'slowness', in contrast with 'bradyacusia', from Greek *ἀκούειν* 'to hear', where the internal argument shifts its referential boundary to 'dullness'. Lexical ambiguity is greater when the deverbal constituent, which is the constituent that governs the syntactic relation in a synthetic compound, undergoes polysemy. For example, /-phil-/, from Greek *φίλειν* 'to have a natural taste or propensity toward', as in 'Russophile', may be intrinsically ambiguous when it shifts its referential boundary to 'to have a sexually perverted propensity toward', as in 'zoophile'.

In light of these examples, it is clear that context should help the interpreter infer the accurate lexical meaning of each constituent, as it does for the relational meaning between these constituents. Geeraerts, Grondelaers, and Bakema (1994) have examined the question of prototypicality in conjunction with the interpreter's experience of a given lexical unit. They assert that 'prototypical categories should not be studied in isolation from their experiential context' (p.47). As a result, they have defined prototypicality according to four essential characteristics, which I would like to summarize and test with semiotic units:

- Prototypical categories cannot be defined by means of a single set of attributes.

- Prototypical categories have a semantic structure, which takes the form of a set of clustered and overlapping meanings.

- Prototypical categories exhibit various degrees of membership for each representative.

- Prototypical categories are blurred at the edges.

The first characteristic claims that a componential analysis can never be complete, and that experiential context may contribute to providing further semantic components. Should we examine /-phyt-/ from Greek *φυτόν* 'plant', we would gather that the generally accepted semantic components are: 'living organism', 'growing in earth', 'having roots', 'requiring water', 'containing chlorophyll', etc. However, experience shows that there are certain varieties of /-phyt-/, which do not grow in the earth or do not have roots. Therefore, the set of attributes required to define the semiotic unit /-phyt-/ may vary from one syntagma to another.

The second characteristic claims that each semiotic unit has individual semantic components that are shared with other semiotic units. Should we examine /-zo-/ from Greek *ζῷον* 'animal' and compare it with /-phyt-/, we would gather that they share the semantic component 'living organism'. Likewise, should we examine /-trich-/ from Greek *θρίξ, τριχός* 'hair' and compare it with /-phyt-/, we would gather that they share the semantic component 'having roots'. Therefore each semiotic element has at least one or

more semantic components common to one or more other semiotic units, but no semiotic unit has semantic components common to all other semiotic units.

The third characteristic claims that there are semiotic units whose referents best represent the category to which they belong. In the vegetable kingdom, the semiotic unit /-phyt-/ is the optimal representative, in so far as it covers a wide variety of plants, while /-dendr-/ from Greek *δένδρον* 'tree' is restricted to woody plants, /-thamn-/ from Greek *θάμνος* 'shrub' is restricted to bush-like plants, /-bry-/ from Greek *βρύον* 'moss' is restricted to sporigerous plants, etc.

The fourth characteristic claims that semiotic units do not have very clearly delineated boundaries, and that it is not uncommon for a semiotic unit to contract or expand semantically. The semiotic unit /-phyt-/ is not confined to the vegetable kingdom but expands toward other biological fields, notably anatomy, with 'osteophyte', and dermatology, with 'dermatophyte'.

I will devote the next section to exploring the different varieties of semantic mutations in syntagmas with quasi-lexemes, and I will demonstrate the importance of componential analysis, which both elicits the identification of referents and sets up the foundation for theories of compounding.

C. Shift in application versus metasemy

The issue of polysemy is inseparable from that of metasemy[55], also known as semantic mutation. As I pointed out earlier, polysemy is an evidence that a semantic mutation has occurred. Metasemy is the dynamic process that leads to polysemy. Furthermore, metasemy being common to every single language (Tournier, 1993), it is no surprise to discover that Latin and Greek have made use of it in the formation of their syntagmas. What the metasemy of constituents suggests is the manifestation of a referential versatility that has been perpetuated from classical to neoclassical syntagmas. The semiotic unit /-phyt-/, as found in 'lithophyte', 'osteophyte', or 'dermatophyte', is a good example of the referential versatility of a constituent in a neoclassical syntagma. All three 'plants' are of a different nature, yet the same morpheme /-phyt-/ is used alike in these syntagmas. The result is that 'lithophyte' is a primary compound, in so far as XY is the hyponym of Y, but 'osteophyte' and 'dermatophyte' are both complex derivatives, in so far as XY is not the hyponym of Y but the qualifier of a referent that is semantically related to Y. It is not uncommon for the semantic mutation to occur and then to become opaque, as the complex derivative 'neophyte' demonstrates. Consequently, the main semantic difference between a primary compound and a complex derivative can be summarized as follows:

- A primary compound $[XY]_Z$ is in a hyponymic relation with its head constituent Y, but there is no semantic mutation between Y and Z.

- A complex derivative $[(X + Y)_{qualifier}]_z$ is a two-stage process. The primal stage is the concatenation of two quasi-lexemes that leads to the formation of a qualifier. That qualifier behaves like a primary compound, in so far as it is in a hyponymic relation with its head constituent Y, but there is no semantic mutation between that qualifier and Y. The subsequent stage is the mutation itself, whereby either $(X + Y)_{qualifier}$ becomes syntactically concomitant with Z, or a semantic component of $(X + Y)_{qualifier}$ finds a similar semantic component in Z, thus allowing a 'transfer of meaning'.

Semantic mutation as a term implies that $(X + Y)_{qualifier}$ and Z should have distinct meanings. In contrast, I would argue that Y and Z in a primary compound, as well as Y and the qualifier in a complex derivative, exemplify semantic variations only. Stephen Ullmann (1957) introduces the idea that shift in application, as the transfer from one aspect to another aspect of the same meaning, ought to be distinguished from metasemy, as the transfer from one meaning to another meaning. However, it would be futile to think of them as discrete categories, since they tend to operate on a continuum and have blurred boundaries. Tournier (1985) furthers this idea of semantic variation by identifying different types of shifts in application, which I would like to exemplify by means of syntagmas with quasi-lexemes.

- Shift in application by semantic restriction.

The issue of semantic restriction is related to that of hyponymy. In the case of quasi-lexemes, hyponymy is the most evident expression of prototypicality. For example, 'selachology', from Greek *σέλακος* 'cartilaginous fish', has an internal argument, which refers to what in the western world is commonly considered to be the prototype of a cartilaginous fish, namely, a shark. The relation between 'cartilaginous fish' and 'shark' is that of hyponymy, in so far as a shark is a cartilaginous fish but a cartilaginous fish is not necessarily a shark. Another example is 'pomiculture' from Latin *pōmum* 'fruit'. Once again, the prototypical fruit in the western world is not a mango or a papaya but an apple. It is no surprise that Eve, in the Garden of Eden, should always be represented eating an apple, although there is no biblical evidence that the forbidden fruit was indeed an apple. The choice for an apple is simply based on a cultural preconception[56]. Therefore, if 'pomiculture' refers to the 'exploitation of apples', the relation between 'apple' and 'fruit' is that of hyponymy, in so far as an apple is a fruit but a fruit is not necessarily an apple. Hyponymy usually involves prototypical categories. However, if the prototypical parameter does not come into play, then the deverbal constituent should have an influence on the internal argument's referential meaning. A good example is 'iconolagnia', from Greek *εἰκών* 'image' and *λαγνεία* 'sexual drive'. Since an image is hardly perceived as a prototypical category, the shift from 'image' to 'erotic image' is triggered by the referential content of /-lagn-/. In other words, the idea of being sexually driven by an image turns that neutral image into an erotic image. The compound 'etiology', from Greek *αἰτία* 'cause', is similar, in the sense that 'cause' does not represent a prototypical category. Therefore, the deverbal constituent /-log-/, which is usually found to describe medical fields, turns the referent 'cause' into a 'cause of disease' by semantic restriction.

- Shift in application by semantic generalization.

The reverse process of semantic restriction can be referred to as semantic generalization. The example of 'regicide', from Latin *rēx* 'king', is one of them. Not only can 'regicide' extend its referential meaning to a 'queen murderer', but it can also be applied to the murder of any sovereign, no matter what his or her title is. Thus, the murder of a Saudi prince by suspected extremists in 2003 was rightly qualified, in various newspapers, as a bloody regicide. Likewise, there is in zoology, a family of herbivorous mammals referred to as 'lagomorph', which stems from Greek *λαγώς* 'hare'. Although the referential meaning of *λαγώς* is limited to a defined genus, the syntagma 'lagomorph' is also applied to other genuses of that family, such as rabbits and pikas.

- Shift in application across classemes.

The agent of a synthetic compound may occasionally undergo a classemic transfer. According to the OED, 'myrmecophilic', from Greek *μύρμηξ, μύρμηκος* 'ant', is applied to a zoological family that not only lives on ants but also delights in them. Conversely, 'myrmecophobic' is applied to plants that not only perceive ants to be parasites but are also repelled by them. The suffixal agent undergoes a shift from the animal kingdom to the vegetable kingdom. Likewise, 'somnifuge', from Latin *somnus* 'sleep' and *fugāre* 'to repel', depending on whether the agent is a person or a medicinal pill, may undergo a classemic transfer from the human kingdom to the kingdom of manufactured objects.

- Shift in application from active to passive.

The synthetic compounds with the deverbal constituent /-phob-/ behave much like primary compounds, in so far as the compound as a whole is a hyponym of the suffixed semiotic unit /-phob- + -ia/. For a compound like 'gerontophobia', from Greek *γέρων, γέροντος* 'old age', both constituents have a fixed referent, and the shift in application occurs in the syntactic relation between the constituents, whereby one can fear old age in others but also fear to be old. Likewise, 'tocophobia', from Greek *τόκος* 'childbirth', causes the interpreter to wonder if the fear is related to making someone pregnant or being pregnant. Eventually, a person can suffer from 'erythrophobia', from Greek *ἐρυθρός* 'red'. This example shows again the borderline between shift in application and metasemy; as a matter of fact, we would tend to think that rather than representing the color strictly speaking, /-erythr-/ is either the blush[57] on one's face or the rash on one's skin, whereby the color is metonymically the result of a stimulus.

- Shift in application by hypallage.

The discrepancy between syntactic and semantic relations in a syntagma is what I refer to as hypallage. For example, the synthetic compound 'diplophobia' is problematic, as the internal argument of /-phob-/ is syntactically /-dipl-/, from Greek *διπλόος* 'double', but semantically /-dipl- + -ops-/, from Greek *δίπλοψις* 'double vision'. Likewise, 'omophagy' does not consist in eating raw but in eating raw meat. In terms of semantic roles, the internal argument is not the patient 'meat' but a feature of the patient, namely,

'uncooked'. The process of hypallage as an 'aspect of the same meaning' may exceed its boundaries and be treated as a different meaning by an association of ideas[58] between the entity and its characteristic.

As these various types of shifts in application show, on the one hand, there is no definite degree to which an aspect of the same meaning becomes a different meaning; on the other hand, we may wonder if a shift in application is not simply a lesser property of a metasemous process. What we do know is that these semantic movements may be explained either in terms of a concomitance between a referent and another referent that has a direct relation with it (metonymy), or in terms of a similarity between a referent and another referent that has no direct relation with it (metaphor).

- Metonymy

A metonymy is a lexicogenic process, which, in the framework of quasi-lexemic formations, is found firstly in complex derivatives, whereby a referent is in a syntactic relation with another referent, and the two form a phrasal structure that can be configured at the syntagmatic level as a qualifier-head relation. Warren (2002) remarks that it is a preconceived idea that a metonymy should involve a substitution of referents. Instead, both referents form a combination. Therefore, in 'pachyderm', /-pach- + -derm-/ is the qualifier and /-ø/ the head, which refers to the mammal itself. The phrasal structure becomes [/-ø/ has /-pach- + -derm-/] and may be glossed as a 'mammal that has thick skin'. We notice that the qualifier /-pach- + -derm-/ is in no way a substitute for the head /-ø/, but it complements that head syntactically. This type of metonymy, which Warren calls a 'referential metonymy', is prevalent in complex derivatives, as testified by the examples 'bradype', 'dolichocerous, 'oligochaete', etc.

A metonymy is found secondly in synthetic compounds, in which the phrasal structure can be configured at the syntagmatic level as a relation between the referent represented by the internal argument and the referent represented by a concomitant entity. This metonymy is also called 'referential metonymy', as it allows us to replace the syntagma by a phrasal structure. Thus /-cheil- + -phag-/, from Greek *κεῖλος* 'lip' and *φάγειν* 'to eat', may be glossed as 'one eats the skin of the lips'. The referents 'skin' and 'lip' are concomitant in so far as the lips are made of skin. Similarly, /-hagi- + -latr-/, from Greek *ἅγιος* 'holy' and *λατρειν* 'to worship', may be glossed as 'one worships a person who is holy', or, in other words, 'one worships a saint'. There is concomitance between 'holy' and 'saint', in so far as holiness makes a saint. It is not uncommon for such concomitance of referents to give rise to a metonymical series. For instance, the semiotic unit /-phall-/, from Greek *φαλλός* 'penis', may be used literally as a male organ or may be glossed as a person with a penis, namely, a man. This metonymical application gives rise to the series /-phall- + -centr-/, which is glossed as 'one is centered on man', /-phall- + -crat-/, which is glossed as 'one is governed by man'[59], etc.

The referentiality of a metonymy becomes arguable when a syntagma can only be glossed as a bi-clausal structure displaying a relation of consequence between the two otherwise concomitant referents. Warren refers to it as a 'propositional metonymy'. For example, the aforementioned semiotic unit /-phag-/, as found in /-cheil- + -phag-/,

would be better glossed as ‘one bites the skin of the lips’. The consequence of biting may or may not lead to eating. Likewise, the semiotic unit /-hymen-/, from Greek *ὑμήν* ‘membrane’, has a relation of consequence between ‘marriage’ and the ‘membrane of the vagina’, in so far as virgins were supposed to have that membrane broken on the wedding night. Eventually, the semiotic unit /-cid-/, from Latin *caedere* ‘to kill’, also displays a relation of consequence between the agent and his or her action, in so far as a person who murders is led to being involved in a murder.

Based on Warren’s hypothesis of implicit relations between antecedents and consequents, here is how we may paraphrase ‘propositional metonymies’:

Step 1:

	Antecedent		Consequent
/-phag-/	biting	leads to	eating
/-hymen-/	marriage		loss of virginity
/-cid-/	person who murders		murder

Step 2:

Syntagma		Bi-clausal structure
/-cheil- + -phag-/	may be paraphrased as	If one bites the lips, then one eats the lips.
/-hymen- + -log-/		If one speaks of marriage, then one speaks of losing virginity
/-hom- + -cid-/		If one is a murderer, then one murders

As we are about to find out, metaphor is an altogether different metasemous process that relies solely on a semantic operation.

- Metaphor

A metaphor is a lexicogenic process that involves a semantic operation between two unrelated referents by means of one or more transfer components. This operation is made possible through a componential analysis of each referent.

A componential analysis consists in outlining the sememe, that is to say, the set of semes, also known as semantic components, of each individual referent. Should we take the semiotic unit /-copr-/, from Greek *κόπρος* ‘excrement’, we would end up with this:

/-copr-/ [Sememe]
decayed matter
expelled by the intestines
emitting a filthy smell
repelling to the senses
used as a fertilizer
etc.

Semantic components may be further divided into major semantic components and minor semantic components (Tournier, 1991). In the aforementioned sememe, I would say that 'decayed matter' is a major component that will be systematically used no matter what kind of excrement we are dealing with, whereas 'used as a fertilizer', being a less universal feature, would be described as a minor component.

The first step toward metaphor is to identify another entity that would share at least one semantic component with the original entity, whether this component is major or minor, such as:

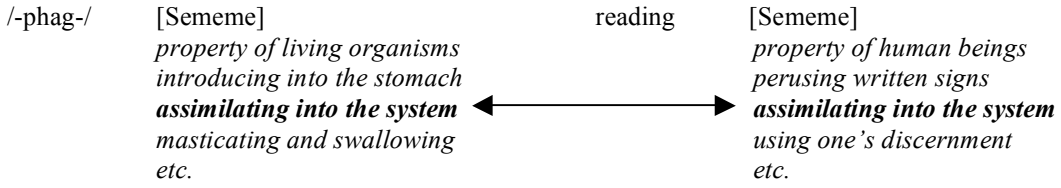
vulgarity [Sememe]
abstract feature (which may have concrete repercussions)
lacking sophistication
displaying offensive or ridiculous manners
repelling to the senses
etc.

Once a semantic component has been identified as common to two sememes, then a metaphor is made possible:

/-copr-/	[Sememe]		vulgarity	[Sememe]
	decayed matter			*abstract feature*
	expelled by the intestines			*lacking sophistication*
	emitting a filthy smell			*displaying offensive manners*
	repelling to the senses	◄——►		***repelling to the senses***
	used as a fertilizer			*etc.*
	etc.			

The second step is to transfer all other semantic components to the initial signifier. In the present example, the sememe of 'vulgarity' will be applied to the quasi-lexeme /-copr-/, and by adding a new sememe to it, that transfer will make /-copr-/ polysemous, as 'coprolith' and 'coprolalia' may testify.

With synthetic compounds, it is not unusual for the deverbal constituent to undergo a metaphor. Let us examine the example of 'bibliophagist' from Greek *βιβλίον* 'book' and *φάγειν* 'to eat':



Once again, this example shows that the sememe of another lexical unit, namely, 'reading', is applied to the quasi-lexeme /-phag-/ to make it polysemous.

With complex derivatives, the process of metaphorization may be somewhat different. If we look at 'neophyte', from Greek *νέος* 'new' and *φυτόν* 'plant', we end up with this:

This metaphor is based on a semantic component being common to a plant and a novice, namely, their potential to undergo development. Evidently, this trait is in itself metaphorical, since the plant is meant to grow physically, while a novice is meant to grow intellectually or spiritually. This derivative may be glossed as a '**novice** is a **new plant**'. The way this complex derivative is different from the previous synthetic compounds is that its phrasal structure has three lexical units rather than two.

This observation leads us to stipulate that, if a synthetic compound undergoes a metaphor, it is on one of its constituent at a time, and that metaphor should be of a binary structure (tenor/vehicle), such as:

vulgarity	is	/-copr-/
tenor		*vehicle*

Incidentally, such binary structures may easily give rise to a metaphorical series, such as /-copr- + -lal-/, from Greek *λαλειν* 'to speak (in a pathological manner)', /-copr- + -phas-/, from Greek *φάναι* 'to say', and /-copr- + -phem-/, from Greek *φάναι* 'to say'. These are all glossed as 'one expresses verbal vulgarity'.

In contrast with synthetic compounds, if a complex derivative undergoes a metaphor, the two constituents are simultaneously involved in the process, and that metaphor should be of a ternary structure (tenor/vehicle/ground), such as:

novice	is	/-neo- +	-phyt-/
tenor		*ground*	*vehicle*

In such a ternary structure, we see clearly that the ground is what complements the vehicle to convert it into the tenor. From the model 'the camel is the ship of the desert', in which 'camel' is the tenor, 'ship' the vehicle, and 'desert' the ground, let us examine the complex derivative 'hippopotamus', from Greek *ἵππος* 'horse' and *ποταμός* 'river':

/-hipp-/	[Sememe]	hippopotamus	[Sememe]
	domesticated mammal		*wild mammal*
	identified by its mane		*endowed with large tusks*
	liable to be ridden		*frequents rivers*
	hoofed		*short legged*
	gregarious ⟷		***gregarious***
	etc.		*etc.*

An interesting point in this metaphor is that the transfer component 'gregarious' is a minor component. None of the major components are common to both sememes, except the fact that a 'horse' and a 'hippopotamus' are mammals, but this is not a sufficient feature, since the tenor and the vehicle are part of the same classeme (the animal kingdom), and therefore any mammal could have served as the vehicle[60]. Thus, for lack of a major component to be common to both sememes, the ground, as a complement[61], comes to differentiate 'horse' from 'hippopotamus' and to complete the metaphor:

hippopotamus	is not	horse
tenor		*vehicle*

But:

hippopotamus	is	river	horse
tenor		*ground*	*vehicle*

Overall, the difference between a metonymy and a metaphor is that, according to Roman Jakobson (1956), a metonymy is a syntagmatic process involving a combination of two referents that form a syntactic structure, whereas a metaphor is a paradigmatic process involving, for each referent, a selection of components that are subjected to a semantic transfer. More importantly, as Warren points out, a metonymy is limited to one possible relation between its two referents. By contrast, the two referents in a metaphor may share more than one possible semantic component, thus making that process a 'potentially more suggestive and powerful, yet economic meaning-creating device' (p.117).

The next part is devoted to testing quasi-lexemes through the theories of compounding, as formulated by Ten Hacken on the one side and Lieber on the other. Using the medium of componential analyses, the main purpose will be to evaluate the importance of paradigmatic extension in compounds with quasi-lexemes.

PART IV. TESTING QUASI-LEXEMES AS ELEMENTS OF COMPOUNDS

A. Defining a compound

In the present analysis, I have taken the liberty of applying the term 'simple derivatives' to what traditional linguistics calls 'derivatives' in the strict sense, that is to say, 'affixed lexical units', which consist in applying exponents of LCRs to independent morphemes. In contrast, I have applied the term 'complex derivatives' to what are commonly referred to as 'exocentric compounds'. As I demonstrated before, 'complex derivatives' are not morphological derivatives but morpho-semantic ones. These derivatives are understood in the large sense, as endocentric compounds that are augmented by metasemous processes. Finally, I have reserved the term 'primary and synthetic compounds' for syntagmas that have both morphological and syntactic heads represented by at least one of their independent morphemes.

Before addressing theories of compounding, it is essential to summarize briefly what traditional linguistics claims about compounding, and to explain that the reason I have restricted the definition of a compound to a syntagma with independent morphemes that have a distinct type of semantic relation between each other is to benefit Ten Hacken's and Lieber's theories.

The term 'syntagma', from Greek *συντάσσειν* 'to arrange together', is understood as a 'string of lexical elements that are in a syntactic relation to each other'. Therefore, when two or more lexical elements concatenate, the result is called a 'syntagma'. As we have observed with simple derivatives, a syntagma may also imply the application of an exponent of an LCR to an independent morpheme, as long as the two form a syntactic unit. In the framework of traditional linguistics, a compound boils down to the concatenation of two lexical elements that form a new lexical unit[62]. Bauer (1983) suggests that, at the morphological level, a 'compound lexeme (or simply a compound) can thus be defined as a lexeme containing two or more potential stems' (p.28). At the semantic level, however, the status of each element, and their relation to each other define two major[63] types of compounds: endocentric and exocentric. According to Ten Hacken's theory, the endocentric type, with X being non-referential in interpretation and Y being in a hyponymic relation to Z, is the only syntagma that may be legitimately called a 'compound'. This perspective, initiated by Marchand, sets the foundation for a new approach to compounding. The point is not to exclude purposelessly a certain category of syntagma, but to show that primary and synthetic compounds share a common ground in the non-referentiality of the modifier and in the hyponymic relation between the head and the compound as a whole. As for exocentric compounds, Geert Booij (1992) argues that, although their interpretation is different from that of endocentric compounds because of the position of their semantic head, 'the second stem is clearly the [syntactic] head of the compound' (p.39). Lieber, who concurs with Booij, uses that argument to develop a method of lexical semantic representation of compounds, whereby independent morphemes and exponents of LCRs have the opportunity to integrate their respective referents in the formation of a single referent.

B. Quasi-lexemes and Ten Hacken's theory

Pius Ten Hacken (1999) proposes a definition of compounding that is intended to be valid for all languages. Following his definition is a set of tests whose applicability requires that one should first and foremost identify individual semiotic or lexical units displaying evidence of compositionality, as is the case with quasi-lexemic syntagmas.

According to him, a compound is a structure $[XY]_Z$ or $[YX]_Z$, such that:

- the denotation of Z is a subset of the denotation of Y;
- if S is a possible way of specifying Y, the denotation of Z is determined by the range of S's that are compatible with the semantics of X;
- X does not have independent access to the discourse.

Regarding the preamble, Ten Hacken's presumption that a compound should be a binary structure such as $[XY]_Z$ or $[YX]_Z$ somewhat restricts its potential to be an augmented compound, as mentioned in Part II. D. Although most augmented compounds have their constituents concatenated in stages, such as $[W[XY]_{Z1}]_{Z2}$, which allows them to be perceived in layers as binary structures, there are also augmented compounds, whose constituents are concatenated all at once such as $[WXY]_Z$. Therefore, to claim that a compound is strictly a binary structure amounts to assuming that it is limited to the concatenation of two lexical units.

The first clause deals with the hyponymic relation between the head constituent and the compound as a whole. Ten Hacken is expanding Allen's (1978) formulation of this relation, which was originally as follows:

IS A Condition:
In $[XY]_Z$, Z 'IS A' Y

What Ten Hacken appropriately rectifies from Allen's formulation is that even though the head of a compound is the right-hand constituent $[XY]_Z$ in the large majority of cases, it may also be the left-hand constituent $[YX]_Z$ without jeopardizing its potential to form a compound.

As for the hyponymic relation conveyed by this clause, quasi-lexemes are approached as semiotic units so that their inadequacy to have direct access to discourse is remedied. In that respect, /-lith- + -phyt-/ is a /-phyt-/, like a 'stone-plant' is a 'plant'.

The second clause deals with the variable relations between the head and the modifier. Allen (1978) proposes the Variable R Condition, which refers to the 'variability in primary compound meanings' (p.93). As discussed in Part III. B.1., the range of meanings between the head and the modifier is specified in terms of the semantic features for each of them. Variable R stipulates that, in a primary compound, a componential analysis of the head should help determine the available feature slot in the hierarchy of the modifier. For example, in /-lith- + -phyt-/ the head /-phyt-/ contains, as a major semantic component, 'vegetable kingdom'. This non-human feature makes the semiotic

unit /-phyt-/ incompatible with the human feature of the verb ‘to speak’. Hence, the phrasal structure /-phyt-/ speaks to /-lith-/ is ruled out.

Ten Hacken’s second clause does not claim that an accurate relation between Y and X ought to be determined. We are about to discover that, in order to accept a syntagma as a compound, the opposite result is actually required. But a componential analysis of the head is essential to establish a preliminary set of possible connecting links to the modifier. Once this set of connecting links has been established, each of these links may be classified against what Allen names the ‘hierarchy of semantic features’ in the modifier.

The third clause deals with the referentiality of the modifier. Ten Hacken argues that if this modifier is a common noun, it is ‘interpreted generically’ (p.43). A common noun modifier with a specific referent would be unfit. Conversely, if this modifier is a proper noun, it is interpreted specifically. A proper noun modifier with a generic referent would be equally unfit.

Compounds with quasi-lexemes will conform to this third clause, since their common nouns being used as modifiers are generic by nature. However, the case of /-bibli-/ from Greek *βιβλίον* ‘book’ could be problematic when it is interpreted specifically as the ‘Bible’ by semantic restriction. Therefore, it is going to be crucial to determine if the passage from /-bibli- + -latr-/ glossed as ‘one worships books’ to /-bibli- + -latr-/ glossed as ‘one worships the Bible’ could indeed involve an obstacle to Ten Hacken’s account of compounding. As for proper nouns, as few as they are with quasi-lexemes, they are always specific by nature. For example, the quasi-lexeme /-are-/ from Greek *Ἄρεος* ‘Mars’ never extends its referential boundary to mean ‘any planet’, but instead forms compounds in which it has invariably the same specific referent, namely, the ‘planet Mars’.

From his definition, Ten Hacken has purposely left aside that which is regarded by Leonard Bloomfield (1933) as commonly accepted criteria for compounding, namely, stress pattern and cohesiveness. This is all the more a judicious reasoning, since the rules of stress and cohesiveness are language-specific. In other words, the definition should be able to embrace quasi-lexemic formations in all languages, including those like French, which does not rely on stress pattern, or like Dutch, which has the tendency to withstand the rules of cohesiveness. Thus, instead of focusing on a feature, which may refute compounding in one language but not in another language, the definition is intended to be universal.

The definition being established, Ten Hacken derives an elementary test, which he names the Structure Mapping Test (SMT), as follows:

> If Z is the alleged compound, impose a structure $[XY]_Z$ or $[YX]_Z$, so that Z is (a kind of) Y, related to X in any of several ways. If it is not possible, Z is not a compound.

Interestingly, the SMT, which focuses on the relation between the compound as a whole and its head constituent, is intended to rule out syntagmas that partake of

derivation as well as syntagmas whose modifier is not transposed, thus minimizing the level of relational ambiguity between the constituents.

In Part III. A., I claimed that not all syntagmas fall into the division of compounds. What I surmised is that, from a lexicogenic perspective, multi-morphemic structures are either derivatives or compounds. Furthermore, a derivative may be made up of a lexeme (or quasi-lexeme) onto which affixes are attached, in the case of a simple derivative, or it may be made up of two or more lexemes (or quasi-lexemes) that qualify the head actualized by a suffix, in the case of a complex derivative. As for a compound, it may be made up of two lexemes (or quasi-lexemes) that may be represented minimally as a binary structure $[XY]_Z$ or $[YX]_Z$ where Z is in a hyponymic relation to the head constituent Y, in the case of a primary compound, or it may be made up of a deverbal constituent Y and a nominal constituent X, which form a Subject-Predicate relation at the level of the underlying sentence, in the case of a synthetic compound.

At this point, I would like to test each of these subdivisions of syntagmas by subjecting them to the aforementioned SMT, knowing that, as Ten Hacken states, 'the application of [this test] cannot be that a construction does belong to compounding, but only that it may or may not belong to compounding' (p.47):

- SMT and simple derivatives

Should affixation be, as Ten Hacken postulates, the 'result of applying a certain derivational operation to [a stem]' (p.47), it is interesting to examine the difference between /-micr-/ as found in 'microbe' and in 'microsecond'.

'microbe'	/-micr- + -b-/ is not a kind of /-b-/ /-b-/ is related to /-micr-/ in only one way. This is NOT a compound.
'microsecond'	/-micr- + second/ is a kind of /second/ /second/ is related to /-micr-/ in only one way. This is NOT a compound.

The example of 'microbe' corroborates Marchand's prediction, according to which, 'if a formation $[XY]_Z$ cannot be explained by Y determined by X, but as a person or a thing having Z, then it is not a compound but a derivative'. However, there is no derivational operation of a morpheme on another morpheme, but instead a 'property specified by the adjective over the noun' (Ten Hacken, p.47) at the primal stage. Therefore, in 'microbe', /-micr-/ may not be considered a prefix. Conversely, the example of 'microsecond' shows us that simple derivatives may well display a hyponymic relation between Z and Y. Thus, Ten Hacken's next step is to ensure that Z is related to X in any of several ways, which is not the case with 'microsecond'. Therefore, 'microsecond' is not a compound, simply because /-micr-/ is meant to apply a derivational operation rather than a compositional one.

Another question raised by Amiot and Dal concerns the morphemic category of /-log-/ as found in 'psychologist'. Let us examine if the SMT validates it as an exponent of an LCR:

'psychologist' /-psych- + -log-/ is a kind of /-log-/
/-log-/ is related to /-psych-/ in any of several ways.
This MAY or MAY NOT be a compound.

Although Ten Hacken's test does not allow us to come to a definite conclusion about the status of 'psychologist', we may assert that the hyponymic relation between Z and Y, as well as the fact that there is more than one possible semantic relation between X and Y, provides enough evidence for compounding. Therefore, /-log-/ in 'psychologist' may rightfully be considered a quasi-lexeme.

- SMT and complex derivatives

Since 'microbe' has failed to pass the SMT, we have come to the conclusion that it is a complex derivative, with a head constituent that is neither /-micr-/ nor /-b-/. A complex derivative has been described as a two-stage process. It is important to repeat that, at the primal stage, there is a 'property specified by the adjective over the noun' as the example 'pachyderm' corroborates:

'pachyderm' /-pach- + -derm-/ is not a kind of /-derm-/
/-derm-/ is related to /-pach-/ in only one way.
This is NOT a compound.

We may legitimately say that the first clause, 'Z is not a kind of Y', is enough to determine that a syntagma is a complex derivative even if the second clause, 'Y is related to X in any of several ways', is validated or not. In that sense, such a syntagma as 'chlorophyll' from Greek *χλωρός* 'green' and *φύλλον* 'leaf', which is not inherently defined as a 'green leaf' but as a 'pigment found in green leaves', can be tested through the first clause only:

'chlorophyll' /-chlor- + -phyll-/ is not a kind of /-phyll-/
This is NOT a compound.

From Ten Hacken's discussion, the second clause becomes an important part in deciding on the compositionality of a syntagma when the modifier undergoes a transposition from adjective to noun. One example is 'hippopotamus', in which the qualifier has a modifier *ποταμός* that does not describe a property of the head *ἵππος*, but nevertheless does, out of context, relate to that head in any of several ways:

'hippopotamus' /-hipp- + -potam-/ is not a kind of /-hipp-/
/-hipp-/ is related to /-potam-/ in any of several ways.
This is NOT a compound.

- SMT and primary compounds

The issue of variable semantic relations between X and Y is at the core of primary compounding. However, what Ten Hacken highlights is the fact that only transposition enables a syntagma to have a relational ambiguity between X and Y. It has been previously exemplified by 'lithophyte', in which the modifier /-lith-/ is not a property of the head /-phyt-/ but an entity that can, out of context, relate to that head in any of several ways:

'lithophyte' /-lith- + -phyt-/ is a kind of /-phyt-/
/-phyt-/ is related to /-lith-/ in any of several ways.
This MAY or MAY NOT be a compound.

In the same manner that I predicted with 'psychologist', because of the hyponymic relation between Z and Y and the fact that Y may relate to X in more than one way, we are rightfully entitled to consider 'lithophyte' a compound.

The problem with Ten Hacken's test is the fact that there are syntagmas such as 'onager' from Greek *ὄνος* 'ass' and *ἄγριος* 'wild', or 'brevilingual' from Latin *brevis* 'short' and *lingua* 'tongue', which display a hyponymic relation between Z and Y but do not have a relational ambiguity between X and Y, because of the non-transposed nature of X:

'onager' /-on- + -agr-/ is a kind of /-on-/
/-on-/ is related to /-agr-/ in only one way.
This is NOT a compound.

'brevilingual' /-brev- + -ling-/ is a kind of /-ling-/
/-ling-/ is related to /-brev-/ in only one way.
This is NOT a compound.

The question we may ask ourselves is this: if 'onager' and 'brevilingual' are not compounds, then what are they? On the one hand, we may argue that their respective modifiers, namely, *ἄγριος* and *brevis*, have undergone grammaticalization and are no more than affixes. But the argument is poor, given the fact that all adjectives describing a property would then have the potential to be considered affixes. On the other hand, we may concede that Ten Hacken's test is faulty, and that this may be reflected not only with quasi-lexemic syntagmas but also with vernacular syntagmas. For example, 'onager' has a vernacular counterpart 'wild ass' that is semantically similar, except that 'wild ass' has a $[XY]_Z$ structure, while 'onager' is $[YX]_Z$. According to Ten Hacken, this cannot be a compound, because of the property specified by the adjective over the noun. Therefore, this syntagma partakes more of a fortuitous collocation in that respect. Should 'wild ass' undergo a metaphor to refer to a 'vile and licentious individual' or a 'rogue', the syntagma would automatically become a complex derivative glossed as a 'rogue is a wild ass', with 'rogue' as the tenor, 'wild' as the ground, and 'ass' as the vehicle. As for 'brevilingual', whose vernacular counterpart is either the noun 'short tongue' or the adjective 'short-tongued', its status, in light of Ten Hacken's test, reveals a significant

inconsistency. Actually, Ten Hacken denies that 'short tongue' is a compound, based on the Adjective-Noun construction, but he agrees that 'short-tongued' is a synthetic compound with what he calls an 'Adjective + Noun + Affix construction' (p.54). However, before trying synthetic compounds with the SMT, it is crucial to point out that contrary to Ten Hacken's assumption that a synthetic compound should be a syntagma whose head constituent has been derived by means of a suffix, my position so far (and this is Marchand's position as well) is that a synthetic compound must have a deverbal constituent that acts upon an internal argument represented by a nominal constituent.

- SMT and synthetic compounds

From the outset, Ten Hacken refers to the adjective 'dark-haired' as a type of synthetic compound, contradicting Marchand's analysis of a synthetic compound, which is supposed to have two constituents that form a Subject-Predicate relation at the level of the underlying sentence. In 'dark-haired', 'haired' cannot be decomposed as 'he hairs', because it is not deverbal, it is denominal. Consequently, the syntagma 'dark-haired', glossed as a 'person having dark hair', is a derivative:

'dark-haired' is not a kind of 'haired'
'haired' is related to 'dark' in only one way.
This is NOT a compound.

Therefore, a synthetic compound must have a deverbal constituent, which at the level of the underlying sentence comprises an agent and a verb, and an internal argument, which may be direct or indirect. For example, in 'tree eater', 'eater' comprises an agent and a verb, which are glossed as 'he eats', and 'tree' is the direct internal argument. It is differentiated from 'tree climber', in which 'tree' is the indirect internal argument. As I mentioned before, an indirect internal argument is syntactically comparable to a prepositional phrase, and 'tree climber' may be glossed as 'he climbs **on** trees'. Elizabeth Selkirk (1982) makes an interesting remark that, although both 'tree eater' and 'tree devourer' have direct internal arguments, 'tree devourer' is made up of a deverbal constituent 'devourer', which requires a direct object, as opposed to the deverbal constituent 'eater', which does not. This fact results in 'tree devourer' having only one possible semantic relation between its constituents, and 'tree eater' being, out of context, inherently ambiguous. In the framework of the SMT, 'tree devourer' is not a compound, whereas 'tree eater' and 'tree climber' may or may not be compounds.

Let us examine the following syntagmas with quasi-lexemes: 'hippodrome', 'lithoglyph' and 'philosophy'. All three of them may be considered synthetic compounds, as they have deverbal constituents, namely, *δραμειν* 'to race', *γλύφειν* 'to carve' and *φίλειν* 'to love', which act upon internal arguments represented respectively by *ἵππος* 'horse', *λίθος* 'stone' and *σοφός* 'occult science'. However, *ἵππος* 'horse' is an indirect internal argument, whereas *λίθος* 'stone' and *σοφός* 'occult science' are direct internal arguments. Furthermore, *σοφός* 'occult science' is an obligatory direct object, since *φίλειν* 'to love' is strictly transitive, whereas *λίθος* 'stone' is an optional direct object since *γλύφειν* 'to carve' may be used intransitively[64]:

‘hippodrome’	/-hipp- + -drom-/ is a kind of /-drom-/ /-drom-/ is related to /-hipp-/ in any of several ways. This MAY or MAY NOT be a compound.
‘lithoglyph’	/-lith- + -glyph-/ is a kind of /-glyph-/ /-glyph-/ is related to /-lith-/ in any of several ways. This MAY or MAY NOT be a compound.
‘philosophy’	/-phil- + -soph-/ is a kind of /-phil-/ /-phil-/ is related to /-soph-/ in only one way. This is NOT a compound.

The issue of verb transitivity in synthetic compounds obviously jeopardizes the validity of Ten Hacken’s SMT, the main reason being that ‘philosophy’ cannot be reduced to the status of complex derivative, because, rather than containing an implicit syntactic relation between its constituents, the semantic element of the verb is fully expressed.

Ten Hacken derives a complementary test, which he names the Pronominal Reference Test (PRT):

> Construct a discourse with the alleged compound Z in one sentence, and a pronoun unambiguously referring to the non-head of Z in the next sentence. If the non-head is not a proper noun and the discourse is correct, Z is not a compound.

This complementary test is not in the least meant to substitute for the elementary test but to complement it. Ten Hacken specifies that its application should depend on minimal discourse, since an elaborate context could diminish or nullify its efficiency. Should we try it with the aforementioned examples ‘hippodrome’ and ‘lithoglyph’, here is what we would obtain:

> *Every once in a while, she would go to the hipp[i]odrome. *She liked to see it[i] galloping at full speed.*

> *I am an adept at lith[i]oglyph. *I prefer it[i] to be smooth like marble.*

At first glance, Ten Hacken’s PRT seems to confirm the validity of /-hipp- + -drom-/ and /-lith- + -glyph-/ as compounds. However, in the first example, /-hipp-/ has to be an individual horse with a specificity[65], otherwise the pronoun ‘it’ would be syntactically connected to the antecedent ‘hippodrome’ and would therefore invalidate the process of compounding. The issue of specificity is not as relevant to the second example, in which ‘it’ does not have a definite referent and therefore allows for any individual /-lith-/ to be used within the mineral genus.

As for the syntagma /-bibli- + -latr-/ mentioned earlier, in which /-bibli-/ could be interpreted either collectively and generically as 'books' or individually and specifically as the 'Bible', here is what the PRT assumes:

Paul is bibli$_{[i]}$olatrous. He claims they$_{[i]}$ are more interesting than movies.

Paul is bibli$_{[i]}$olatrous. He believes it$_{[i]}$ is the word of God.

These syntagmas with quasi-lexemes reveal us something about the PRT: the issue is not only that, for Z to be considered a compound, X ought to be a common noun rather than a proper noun, but also that X's referent must be individual and have a specificity. When X's referent shifts from collective to individual, whether it has a specificity or not, its co-referential pronoun automatically shifts from plural to singular. Once the pronoun is singular, it tends to be co-referenced with Z rather than with X. In contrast, when the pronoun is plural, the 'default' co-reference is between that pronoun and X[66]. The evidence for this is that when /-bibli- + -latr-/ is glossed as 'one worships an individual book (which does not have a specificity)' and the singular pronoun is used, the discourse becomes incorrect and therefore compounding is validated by the PRT:

*Paul is bibli$_{[i]}$olatrous. *He claims it$_{[i]}$ is more interesting than the movie version*[67].

Although these tests give a new perspective on the theory of compounding, they prove to be rather restrictive, and as we apply them to synthetic constructions, they render somewhat disparate results. In addition to this, they particularly lack coherence with the way they dissociate synthetic from primary compounds, and with the response they give to the argument structure of synthetic compounds. Such flaws compel us to look for an altogether different method that would draw a framework of lexical semantic representation of each constituent of a compound.

C. Quasi-lexemes and Lieber's theory

In the Marchandean tradition, Rochelle Lieber (2004) acknowledges the division between primary compounds, which she renames 'root compounds', and synthetic compounds. She summarizes what traditional linguistics has claimed about their semantic interpretation, as follows:

- The first constituent of any compound is non-referential in interpretation[68].
- The second constituent of a compound is the semantic head.
- The first constituent in a synthetic compound receives an argument interpretation[69].
- Synthetic compounds cannot be formed from strictly ditransitive verbs.

Before proceeding any further, I would like to critically review each of these clauses, based on my previous discussion.

The first clause does not account for dvandvas, that is to say copulative compounds whose constituents are semantically coordinated, like /-andr- + -gyn-/ from Greek *ἀνήρ, ἀνδρός* 'man' and *γυνή*, *γυναικός* 'woman'. In /-andr- + -gyn-/, both constituents are referential in interpretation, which would thus prevent it from being considered a compound.

The second clause is equally problematic, since there are compounds whose semantic head is indeed the first constituent, as the example 'onager' testifies. Incidentally, Ten Hacken, by formulating a universal definition of a compound, has rightfully corrected this problem as follows:

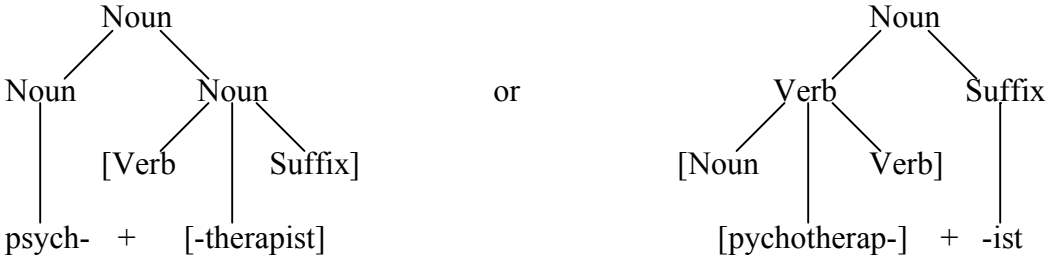
If X is the modifier and Y is the head,
A compound is a structure $[XY]_Z$ or $[YX]_Z$

The third clause restricts the position of the internal argument. Again, there are synthetic compounds whose deverbal constituent is indeed the left-hand constituent of the compound as 'misogyny' testifies.

The fourth clause is not relevant to quasi-lexemes, since no ditransitive Greek or Latin verbs are used in the formation of synthetic compounds.

At the outset, Lieber concurs with Marchand by attesting that primary compounds bear the category and morpho-syntactic features of the head constituent, as follows[70]:

Conversely, synthetic compounds open up two basic structures as examplified by the syntagma 'psychotherapist':



Where Lieber departs from Marchand is by alleging that the optimal way to determine the argument structure of synthetic compounds is through a 'framework of lexical semantic representation that […] does not appeal to the internal structure of those compounds' (p.48)[71]. Her framework consists in analyzing the skeleton and body of each constituent of the compound and adding to this framework a simple principle of co-indexation, which she describes as follows:

> In a configuration in which semantic skeletons are composed, co-index the highest non-head argument with the highest (preferably unindexed) head argument.

The principle of co-indexation ensures that the reference of the two constituents is completely identified. Although this principle does not intend to give evidence that a particular syntagma partakes of compounding, it is, however, able to provide sufficient information on how to interpret that syntagma semantically. The syntagmatic procedure consists in 'putting together the lexical skeletons of the two stems in a relationship of sisterhood' (Lieber, p.49)[72].

In theoretical terms, here is what the skeleton and body representations are:

The skeleton representation is meant to be the same for all interpreters. It has a formal structure. Its two main features are [material] and [dynamic]. Lieber specifies that both features are equipolent (they are positive or negative) and privative (they may be present or absent from the representation). The feature [+material] defines a concrete substance as opposed to [-material], which defines an abstract substance. The feature [+dynamic] defines an event, as opposed to [-dynamic], which defines a state.

The body representation may vary from one interpreter to another. It has a spontaneous structure, and it is similar to the componential analysis that is being performed for the purpose of a metaphorical transfer. It is meant to be made up of denotative as well as connotative features, which I have previously referred to as major and minor semantic components. Furthermore, this representation may be more or less detailed depending on the semantic information that may be obtained from the constituent.

In practical terms, should we use the complex derivative 'hippocamp' from Greek *ἵππος* 'horse' and *κάμπος* 'sea-monster', we would end up with this:

skeleton	[+material ([$_i$])] **/-hipp-/**	[+material ([$_i$])] **/-camp-/**
body	<land animal> <identified by its mane> <liable to be ridden> <hoofed>	<marine animal> <fabulous> <of tremendous size> <inspires fear>

In this framework, we co-index the highest non-head argument [+material (**[i]**)] with the highest head argument [+material (**[i]**)]. However, the skeleton and body representations of the two constituents /-hipp-/ and /-camp-/ are not similar enough to allow for complete identification of a single referent. Lieber confesses that in most cases of endocentric compounds[73], co-indexing will thus have a 'weaker effect'. For lack of finding some commonality between the two referents, the interpreter will have to determine the most plausible relation between the modifier and the head. This issue sends us back to Part III. B. on Warren's connecting links.

With synthetic compounds, co-indexation is a two-step process. Firstly, we must co-index the highest argument of the deverbal constituent with the referential argument[74] of the suffix. Secondly, we must co-index the referential argument of the modifier with the next available argument of the head. Taking the synthetic compound 'psychologist' as an example, we would end up with this:

/-ist-/
[+material, dynamic ([ ], <deverbal constituent>)]

/-therap-/
[+dynamic ([ ], [ ])]

/-therapist-/
[+material, dynamic ([i], [+dynamic ([i], [ ])])]

skeleton [-material ([j])] [+material, dynamic ([i], [+dynamic ([i], [j])])]
/-psych-/ **/-ist-/** **/-therap-/**

In this framework, we co-index the highest argument of the deverbal constituent [+dynamic (**[i]**, [ ])] with the referential argument of the suffix [+material, dynamic (**[i]**)]. In order for the concatenation of the two constituents /-psych-/ and /-therapist-/ to occur, we co-index again the referential argument of the modifier [-material (**[j]**)] with the next available argument of the head [+material, dynamic ([i], [+dynamic ([i], **[j]**)])].

As addressed in Part II. C., the problem is that 'psychotherapist', as the compounding of the semiotic unit /-psych-/ and the lexical unit 'therapist', is quite unique. The vast majority of synthetic compounds with quasi-lexemes are formed with heads that have no direct access to discourse. For example, 'anthropophagist' is not the concatenation of the semiotic unit /-anthrop-/ and the lexical unit 'phagist', but is rather perceived as being formed all at once (e.g. /-anthrop-/ + /-phag-/ + /-ist-/). Lieber's theory would have to account for two simultaneous co-indexings; in other words, the referential argument of the modifier is co-indexed with the highest argument of the deverbal constituent, and the next available argument of the deverbal constituent is co-indexed with the referential argument of the suffix. This would produce the following:

/-anthrop-/
[+material ([ ])], [([<head>])]

/-ist-/
[+material, dynamic ([ ], <deverbal constituent>)]

/-phag-/
[+dynamic ([ ], [ ])]

skeleton [+material ([$_i$])] [+material, dynamic ([$_i$], [+dynamic ([$_i$], [$_i$])])]
/-anthrop-/ **/-ist-/** **/-phag-/**

However, since simultaneous co-indexing does not help us discern the intuitively more plausible basic structure (e.g. /-anthrop- + -phag-/ + /-ist-/ or /-anthr-/ + /-phag- + -ist-/), we can deal with 'anthropophagist' at the level of the underlying sentence as I have previously shown. To put it differently, since the principle of co-indexation is primarily about capturing the argument representation, I suggest that although 'phagist' is not an independent lexical unit, it may be rendered as 'he eats', exactly like 'therapist' is rendered as 'he heals'[75]. I would even surmise that the suffix /-ist-/, as an agentive suffix, is always the external argument in relation to any deverbal constituent. From that point, we may expect 'anthropophagist' to have the exact same co-indexing as 'psychotherapist':

skeleton [+material ([$_j$])] [+material, dynamic ([$_i$], [+dynamic ([$_i$], [$_j$])])]
/-anthrop-/ **/-ist-/** **/-phag-/**

Another problem concerns synthetic compounds that have 'split heads', as testified by '**mis**ogyn**ist**', in which there is no contiguity between the deverbal constituent and the suffix. Here is how the principle of co-indexation would treat this syntagma:

/-ist-/
[+material, dynamic ([ ], <deverbal constituent>)]

/-mis-/
[-dynamic ([ ], [ ])]

/-mis-[–]-ist-/
[+material, dynamic ([$_i$], [-dynamic ([$_i$], [ ])])]

skeleton [+material ([$_j$])] [+material, dynamic ([$_i$], [-dynamic ([$_i$], [$_j$])])]
/-gyn-/ **/-ist-/** **/-mis-/**

Other than proving the correct argument structure between morphemes, the principle of co-indexation has no means of predicting what the constituent order should be. It would have been interesting indeed to show the reason why a formation like 'gynomisist' is ruled out[76].

In Part II. C., I also discussed the fact that the internal argument may be indirect, as a result of being bound to an intransitive verb. For example, the Greek verb *δραμειν* 'to race' is prone to make synthetic compounds in which the internal argument is indirect. As I mentioned before, /-hipp- + -drom-/ can be glossed as 'one races with a horse'. However, in light of Lieber's theory, the problem with such arguments is that if they are not core arguments, or 'obligatory arguments', then they are not internal arguments at all, and they ought to be considered oblique arguments, or 'adjuncts'.

Elizabeth Selkirk (1982) claims that any compound whose deverbal constituent governs an oblique argument rather than a core argument is, by definition, a pseudo synthetic compound. Lieber agrees with that perspective, since her principle of co-indexation is meant to account for compounds with obligatory arguments, namely, external and internal arguments. Therefore, compounds such as 'hippodromist', whose deverbal constituent is an intransitive verb and whose argument is oblique, fall systematically into the category of pseudo synthetic compounds and are ruled out of Lieber's theory.

At this point, if we take the quasi-lexeme /-mach-/ from Greek *μάχεσθαι* 'to fight', we find out that it may be used both transitively and intransitively, as the examples 'theomachist' and 'pyromachist' testify. The syntagma 'theomachist' from Greek *θεός* 'god' is a synthetic compound, which may be glossed as 'he fights the gods'. The syntagma 'pyromachist' from Greek *πῦρ, πυρός* 'fire' is a pseudo synthetic compound, which may be glossed as 'he fights **with** fire', and its oblique argument is a prepositional phrase, which indicates a means. Therefore, 'theomachist', but not 'pyromachist', may be tested with Lieber's principle of co-indexation.

/-ist-/
[+material, dynamic ([ ], <deverbal constituent>)]

/-mach-/
[+dynamic ([ ], [ ])]

/-machist-/
[+material, dynamic ([$_i$], [-dynamic ([$_i$], [ ])])]

skeleton [-material ([$_j$])] [+material, dynamic ([$_i$], [+dynamic ([$_i$], [$_j$])])]
/-the-/ **/-ist-/** **/-mach-/**

As for the syntagma /-gigant- + -mach/, which may be glossed as 'giants fight', we gather that there is no internal argument involved in that formation; instead, the first constituent turns into an external argument, and the deverbal constituent is used intransitively. In that respect, a compound like '***gigant**omach**ist**' is alexical in so far as it is made up of two agents. With vernacular compounds, we would solve this issue by substituting the agentive suffix with a patientive suffix, such as /-ee/, and co-indexing would look like this:

*skeleton [+material ([$_j$])] [+material, dynamic ([$_i$], [+dynamic ([$_j$], [$_i$])])]
/-gigant-/ **/-ee-/** **/-mach-/**

However, no such patientive suffix exists within quasi-lexemic syntagmas. Instead, what is being derived is a suffix that plays no role in argument structure but merely indicates the lexical category to which the syntagma belongs (e.g. 'gigantomach**y**' is a noun, 'gigantomach**ize**' is a verb, etc.).

To summarize, when it comes to quasi-lexemic syntagmas, Lieber's principle of co-indexation may be applied to only one paradigma[77]:

skeleton [+/-material ([$_j$])] [+material, dynamic ([$_i$], [+/-dynamic ([$_i$], [$_j$])])][78]
/internal argument/ /external argument/ /deverbal constituent/

In this paradigma, the external argument which may be /-ist-/ but also /-er/[79], /-or/, /-ian/, /-e/ or /-ø/ is always represented as [+material, dynamic ([ ], <deverbal constituent>)][80].

The deverbal constituent may be [+dynamic ([ ], [ ])] like /-mach-/ or [-dynamic ([ ], [ ])] like /-mis-/.

The internal argument may be [+material ([ ])] like /-gyn-/ or [-material ([ ])] like /-psych-/.

In addition to this, although Lieber's principle does not allow the interpreter to evaluate the constituent order, the reality is that the head of the synthetic compound may be made up of continuous morphemes (e.g. /-anthrop- + **-phag-** + **-ist-**/) or discontinuous morphemes (e.g. /**-mis-** + -gyn- + **-ist-**/).

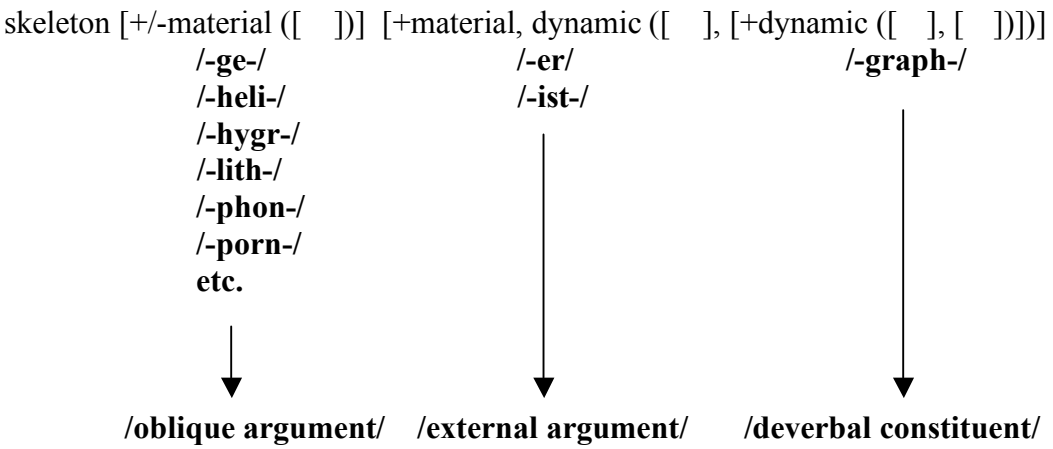
Despite the fact that Lieber's principle of co-indexation requires the suffixal external argument of a synthetic compound to be agentive, once it has passed the test of agentivity, it may be further derived or substituted with another suffix that will assign that compound an appropriate lexical category without depriving it of its synthetic nature. However, to be called a synthetic compound, a syntagma must be made up of an internal argument governed by a deverbal constituent. Any compound with a deverbal constituent that does not fit in the aforementioned paradigma is, by definition, a pseudo synthetic compound, which does not lend itself to Lieber's theory. At this point, let us examine the extensibility of the paradigma with the prototypical deverbal constituents /-graph-/ and /-phil-/.

To start out, should we test the compound 'photographer' from Greek *φῶς*, *φωτός* 'light' and *γράφειν* 'to write', we would end up with this:

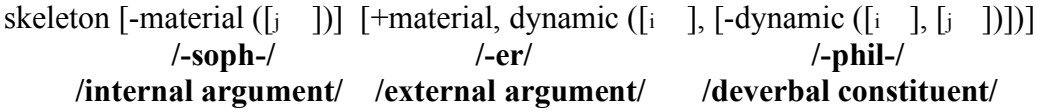
skeleton [-material ([ ])] [+material, dynamic ([ ], [+dynamic ([ ], [ ])])]
/-phot-/ /-er/ /-graph-/
/oblique argument/ /external argument/ /deverbal constituent/

We may conclude that 'photographer' does not fit in the paradigma, since the quasi-lexeme /-phot-/ is not an internal but an oblique argument. Therefore, it is a pseudo synthetic compound. Also, this example predicts that the deverbal constituent /-graph-/ can only produce pseudo synthetic compounds, since it stems from a strictly intransitive verb, and no direct object can participate in the argument structure.

We can draw the diagram of all the pseudo synthetic compounds with /-graph-/ as their deverbal constituent, as follows:

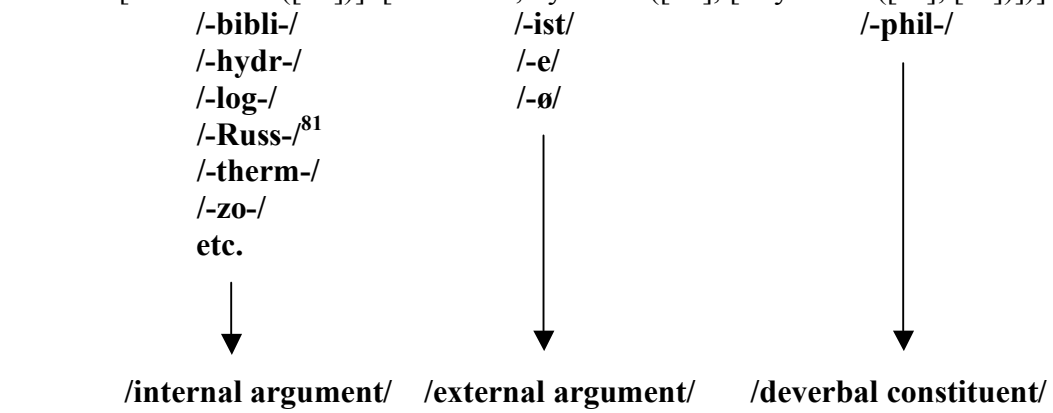


In comparison, the compound 'philosopher' from Greek *φίλειν* 'to love' and *σοφός* 'occult science' would be rendered as:

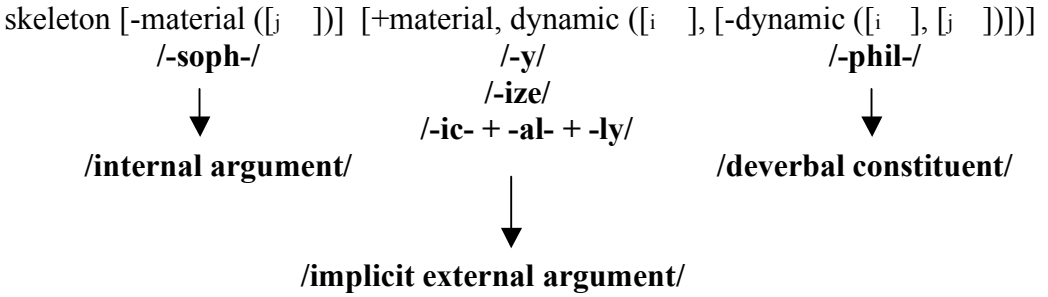


The syntagma 'philosopher' fits in the paradigma, since the quasi-lexeme /-soph-/ is indeed the internal argument. Therefore, it is a synthetic compound. Also, this example predicts that the deverbal constituent /-phil-/ can only produce synthetic compounds, since it stems from a strictly transitive verb whose direct object participates in the argument structure.

We can draw the diagram of all the synthetic compounds with /-phil-/ as their deverbal constituent, as follows:



At this point, the agentive suffix /-er/ in ‘philosopher’ may be substituted with a non-agentive suffix (e.g. ‘philosoph**y**’, ‘philosoph**ize**’, etc.), and nowise can that compound lose its synthetic nature:



Unfortunately, the presence of agentive suffixes /-ist-/, /-er/, /-or/, /-ian/, /-e/, or /-ø/ is not necessarily evidence of synthetic compounding, since not only are they used with pseudo synthetic compounds (e.g. ‘hippodromist’, ‘chiropractor’, ‘geographø’, etc.), but also with simple derivatives (e.g. ‘dentist’, ‘factor’, ‘historian’, etc.), and with complex derivatives (e.g. ‘anthropomorphist’)[82].

As I discussed before, Marchand (1969) demonstrates that in the case of a synthetic or pseudo synthetic compound, the constituents have an explicit syntactic relation. In other words, ‘philosopher’ may be glossed as ‘he loves the occult science’ and ‘hippodromist’ may be glossed as ‘he races with horses’. Conversely, in the case of a simple or complex derivative, the constituents have an implicit syntactic relation. In other words, at the level of the underlying sentence, the unexpressed verbal element must be recovered. For example, the simple derivative ‘dentist’ may be glossed as ‘he **treats** teeth’. Likewise, the complex derivative ‘anthropomorphist’ may be glossed as ‘he **attributes** the shape of a man’[83]. In addition to the fact that simple and complex derivatives have an unexpressed verbal element, they differ from synthetic and pseudo synthetic compounds in that when their agentive suffix /-ist-/ is substituted with another suffix that does not participate in the argument structure at the level of the underlying sentence, they lose their unexpressed verbal element. For example, ‘dental’ is not glossed as ‘related to one who treats teeth’ but as ‘related to teeth’. Similarly, ‘anthropomorphous’ is not glossed as ‘related to one who attributes the shape of a man’ but as ‘related to the shape of a man’.

This observation predicates that at the level of underlying sentence, the agentive suffix /-ist-/ participates in the argument structure of ‘dentist’, but with the adjectival suffix /-al-/, the argument structure of ‘dental’ is lost. Likewise, the agentive suffix /-ist-/ participates in the argument structure of ‘anthropomorphist’, but with the adjectival suffix /-ous-/, the argument structure of ‘anthropomorphous’ is also lost. Therefore, if, in a non-verbal syntagma whose agentive suffix is substituted with a non-agentive suffix, there is no more argument structure at the level of the underlying sentence, then we may conclude that the non-agentive suffix becomes a mere indicator of the lexical category of that syntagma.

However, the issue of argument structure within complex derivatives is more intricate when metasemous processes come into play in such formations. As I have discussed earlier, it is common for syntagmas with quasi-lexemes to undergo a metonymy or a metaphor as 'pachyderm' and 'dinosaur' prove. In 'pachyderm', from Greek *παχύς* 'thick' and *δέρμα* 'skin', I have argued that the qualifier [X + Y] complements the head Z in so far as Z has [X + Y]; conversely in 'dinosaur' from Greek *δεινός* 'terrible' and *σαύρα* 'lizard', the qualifier [X + Y] parallels the head Z in so far as Z is [X + Y]. In these syntagmas, there is no need to have an agentive suffix, since the head /-ø/ is thematic.

In the framework of Lieber's lexical semantic representation, the presence or absence of a zero-morpheme at the level of the morphological structure is not a problem, because complex derivatives like 'pachyderm' and 'dinosaur' are treated like endocentric compounds, regardless of their further metasemous processes and suffixal derivations. This is the reason why the skeleton and body representations of any similar two-constituent complex derivative follow the structure:

skeleton	[+/-material ([$_i$])]	[+/-material ([$_i$])]
	X	**Y**
body	< … >	< … >
	< … >	< … >
	< … >	< … >

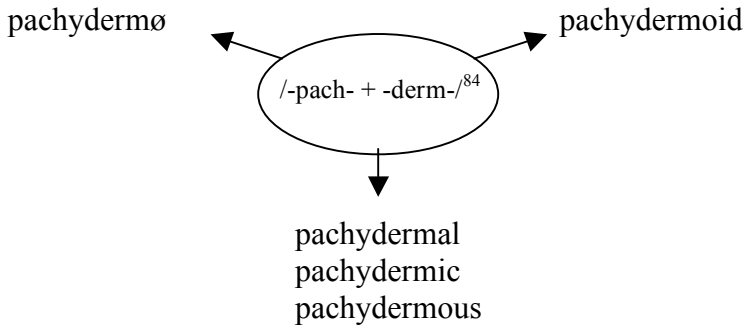
Thus, the principle of co-indexation merely consists in tying together the underived constituents (in the present case, the 'semiotic units'), in order to account for their referential integration at the primal stage. Once the separate referents are tied together, metasemous and derivational processes can occur without altering the initial lexical semantic representation. For example, 'pachyderm' would be treated like this:

skeleton	[-material ([$_i$])]	[+material ([$_i$])]
	/-pach-/	**/-derm-/**
body	<attribute>	<natural>
	<of extension between sides>	<layer of tissue>
	<indicates abundance>	<outer covering of the body>

Complete identification of reference is not always obvious, but using encyclopedic knowledge, we gather that, in this case, the skin is characterized by thickness. The next stage is the metonymical transfer from 'thick skin' to the mammal itself:

Z has /-pach- + -derm-/
Therefore [X + Y] is a part of Z

After the metonymical transfer comes the suffixal derivation:



As for 'dinosaur', here is how it would be treated:

skeleton	[-material ([i])] **/-din-/**	[+material ([i])] **/-saur-/**
body	<character trait> <gigantic> <inspires fear>	<animal> <reptilian> <lives in wall cracks>

Once again, using encyclopedic knowledge, we gather that, in this case, the lizard looks terrible. The next stage is the metaphorical transfer from 'terrible lizard' to the prehistoric animal itself:

/-saur-/	[Sememe] *unextinct animal* ***reptilian*** *lives in cracks* *has an elongated body* *characterized by a scaly hide* *thrives in hot weather* *etc.*	dinosaur	[Sememe] *extinct animal* ***reptilian*** *has a gigantic size* *inspires fear* *oviparous* *etc.*

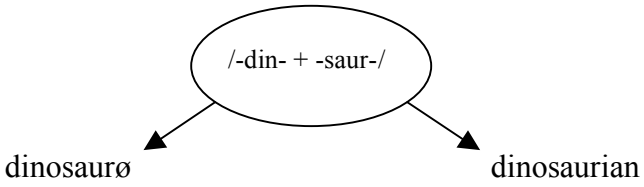
In terms of prototypicality, the quasi-lexeme /-saur-/ serves as the basis for the lexical formation of various prehistoric orders, which all share the same vehicle, such as:

brontosaur	is	thundering	**lizard**
tenor		*ground*	***vehicle***

or

pterosaur	is	winged	**lizard**
tenor		*ground*	***vehicle***

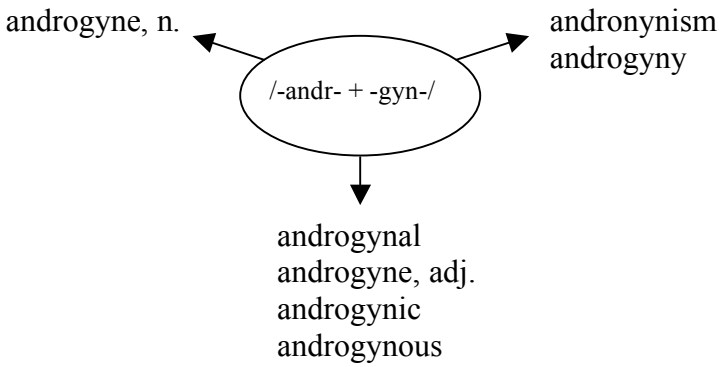
After the metaphorical transfer comes the suffixal derivation:



Liebers concedes that with dvandvas, the referential integration of constituents is easier, because the skeleton and body representations are sufficiently similar. Should we take 'androgynous', we would end up with this:

skeleton	[+material ([$_i$])] **/-andr-/**	[+material ([$_i$])] **/-gyn-/**
body	<human being> <endowed with mind> <bipedous> <can beget offspring>	<human being> <endowed with mind> <bipedous> <can bear offspring>

In this case[85], no metasemous transfer is needed, only suffixal derivation:



By and large, I would maintain that, although this lexical semantic representation developed by Lieber may be useful with dvandvas[86], it proves insufficient with primary compounds (or with complex derivatives) whose constituents are generally so dissimilar in skeleton and body that their possible semantic relations are manifold. The interesting part of this representation lies in the fact that complex derivatives are treated like endocentric compounds, and that their subsequent metasemous processes do not alter the initial referential integration of constituents at the primal stage. With synthetic compounds, co-indexation opens the way to interpret the argument structure at the level of the underlying sentence, while restricting, at the same time, the definition of a synthetic compound to a syntagma in which the deverbal constituent obligatorily governs an internal argument.

CONCLUSION

In the lexicographical tradition, combining forms are elements of Greek or Latin origin that typically combine with each other to make up compound lexical units. The present analysis has shown that combining forms actually cover several varieties of bound morphemes and that each of these varieties has its own set of formal, distributional, and segmental properties. My interest in the variety called 'quasi-lexemes' stems from the fact that not only do they share semantic features with the vernacular lexicon of English, but, unlike other varieties of combining forms, they also form prototypes that lend themselves to continuous lexical development. Marchand (1969) maintains that 'In English […] most learned, scientific or technical words are formed on the morphological basis of Latin or Greek' (p.7).

In terms of the morphemic category to which they belong, it is defended by Amiot and Dal (2007), among others, that quasi-lexemes are not affixes, although they may sometimes be assimilated with affixes by undergoing a process of grammaticalization. Likewise, they are not complete lexemes, because of their boundness, but, at the level of the underlying sentence, the two of them constitute the same syntactic division of primary and synthetic compounds and the same semantic division of endocentric and exocentric compounds.

The protolexicality of quasi-lexemes has led me to consider them semiotic rather than lexical units. I have observed that, as semiotic units, they could have access to discourse only by being in syntactic relations with other morphemes in order to form derived or compound lexical units. However, the semantic interpretation of quasi-lexemic formations requires that they should be glossed vernacularly.

The first step, which gave the most tangible results, has been Warren's (1988) analysis of the implied connecting links between constituents. The approach, which follows Allen's (1978) Variable R Condition, is more empirical than theoretical. Yet it has shown that compounds with quasi-lexemes may also be inherently ambiguous with regard to the semantic relations between their constituents. However, rather than presuming that there is an endless number of possible connecting links, Warren argues in favor of a limited set of connecting links and that each compound may be positively glossed by means of a contextual knowledge allied with the interpreter's individual competence.

The second step, which gave mediocre results, has been to test whether or not formations with quasi-lexemes follow at all the pattern of compounding. At the outset, the problem is to find an adequate definition of compounding. Although traditional linguistics claims that compounding simply means concatenation, Ten Hacken (1999) narrows its definition down to a headed syntagma in which the semantic relation between constituents must be inherently ambiguous. The drawback when adopting such a radical position is to figure out where syntagmas that are not headed or syntagmas that do not display semantic ambiguity should fit. The conclusion to Ten Hacken's theory is that the semiotic character of quasi-lexemes does not impair their potential to form compounds, and that syntagmas with quasi-lexemes pass the test of compounding wherever their counterpart with complete lexemes also do.

The third step, which gave moderate results, has been to interpret the syntactic relations between constituents by capturing the argument structure of compounds. While Ten Hacken's focus is of a semantic nature, which is a legitimate approach to adopt with constituents that have implicit syntactic relations and unexpressed verbal elements, Lieber's (2004) theory of co-indexation brings forth answers to semantic issues by studying the syntax of synthetic compounds. In the same manner that Ten Hacken restricts primary compounds to a limited set of syntagmas, Lieber restricts synthetic compounds to syntagmas with a double argument structure in which the second argument is an internal argument. Once again, it would have been appropriate to explain why the arbitrariness of an oblique argument in a pseudo synthetic compound rules out its potential to be co-indexed, and in what paradigma a pseudo synthetic compound actually fits. Nevertheless, co-indexing, by tying together separate referents into one, has shown that, contrary to vernacular compounds, compounds with quasi-lexemes lend themselves to a single paradigma in which only a suffix can play the role of external argument regardless of the position of the other constituents. This compels me defend that quasi-lexemes tend to participate in compounding in a more restrained and conventional way than complete lexemes.

Glossary of Quasi-Lexemes

The following glossary is divided into six columns:

Column 1 [Quasi-lexeme]

I indicate quasi-lexemes with hyphens on each side to emphasize the fact that each quasi-lexeme has the potential to occur in the initial or final position in a syntagma. Of course, the examples will testify whether or not the respective quasi-lexeme has actually been lexicalized in both positions. When two quasi-lexemes are listed next to each other and separated with a comma, this represents an allomorph (allomorphs are used in complementary distribution). Also, the label [var.] denotes another form of the same quasi-lexeme.

Column 2 [Date]

I indicate the date when the quasi-lexeme was used for the first time in a syntagma in English. This date occasionally coincides with the date of productivity of the quasi-lexeme, that is to say, the date when the quasi-lexeme was generated into a neoclassical compound (cf. Part II. A.).

Column 3 [Origin]

I indicate whether the quasi-lexeme is of Greek or Latin origin. If it stems from both Greek and Latin, then I list only the original etymon.

Column 4 [Meaning]

I indicate the meaning that the quasi-lexeme has within syntagmas. Note that this is not necessarily the meaning of the Greek or Latin etymon. In cases of polysemy, I separate the meanings with a semicolon.

Column 5 [Examples]

I indicate by means of examples if the quasi-lexeme is lexicalized in the initial and/or final position of a syntagma. In each syntagma, I have bolded the quasi-lexeme in order to facilitate its identification.

Column 6 [Sources]

I indicate in which of the three major general dictionaries the quasi-lexeme may be found, be it as a semiotic unit or in a syntagma. The sources are the Oxford English Dictionary (OED), the American Heritage Dictionary (AHD) and the Webster's Third New International Dictionary (W3).

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-abdomin-	1851	Latin *abdōmen*	belly	**abdomin**algia, **abdomin**ocentesis, recto**abdomin**al	OED, AHD, W3
-ac-	1684	Latin *acus*	needle	**ac**upuncture	OED, AHD, W3
-acanth-	1835	Greek *ἄκανθα*	thistle, thorn	**acanth**ocarpous, cten**acanth**us	OED, AHD, W3
-acar-	1890	Greek *ἄκαρι*	mite, tick	**acar**icide, **acar**ology	OED, AHD, W3
-acet-	1818	Latin *acētum*	acid, vinegar	**acet**olysis, pyro**acet**ic	OED, AHD, W3
-acou-, -acous- [var. -acus-]	1839	Greek *ἀκούειν*	hearing	**acou**ophonia, presby**acous**ia	OED, W3
-acr-	1825	Greek *ἄκρον*	extremity, peak	**acr**ocephaly, **acr**ophobia	OED, AHD, W3
-actin-	1898	Greek *ἀκτις, ἀκτῖνος*	radiation, ray	**actin**iform, **actin**opoda, disco**actin**e	OED, AHD, W3
-acut-	1571	Latin *acūtus*	sharp	**acut**iplantar	OED, W3
-adelph-	1858	Greek *ἀδελφός*	brother	**adelph**ogamy, pent**adelph**ous	OED, W3
-aden-	1881	Greek *ἀδήν*	gland, lump	**aden**iform, **aden**oblast, sial**aden**itis	OED, AHD, W3
-adip-	1803	Latin *adeps, adipis*	fat, lard	**adip**ocele	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-aeg-	1834	Greek *αἴξ, αἰγός*	goat	**aeg**ophony	OED, W3
-aer-	1782	Latin *aēr*	air, atmosphere	**aer**iform, **aer**ogenous	OED, AHD, W3
-aet-	1893	Greek *ἀετός*	eagle	**aet**osaur, circ**aet**us	OED, W3
-agath-	1838	Greek *ἀγαθός*	good	**agath**opoietic	OED, W3
-agog-, -agon-	1648	Greek *ἄγειν*	leading	dem**agog**ue, prot**agon**ist	OED, AHD, W3
-agor-	1802	Greek *ἀγορά*	place of gathering	**agor**aphobia, phantasm**agor**ia	OED, AHD
-agr-, -agri-	c1398	Greek *ἄγριος*	wild	on**agr**a, **agri**ology	OED, AHD, W3
-agr-	c1398	Greek *ἄγρα*	seizure of pain	pod**agr**a	OED, AHD, W3
-agr-	1603	Latin *ager, agrī*	field	**agr**iculture, **agr**onomy	OED, AHD, W3
-ailur-	1905	Greek *αἴλουρος*	cat	**ailur**ophobia	OED, AHD, W3
-al-	1731	Latin *āla*	wing	**al**iferous	OED, AHD, W3
-al-	1885	Greek *ἅλς*	sea	Arct**al**ian	OED, W3
-alb-	1879	Latin *albus*	white	**alb**iflorous, **alb**ocracy	OED, AHD, W3
-aleur-	1656	Greek *ἄλευρον*	flour	**aleur**omancy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-alex-	1605	Greek *ἀλέξειν*	warding off	**alex**ipharmacon	OED, AHD
-alg-	1547	Greek *ἄλγος*	pain	**alg**ologist, ceph**alg**y	OED, AHD, W3
-allant-	1863	Greek *ἀλλᾶς, ἀλλᾶντος*	foetal membrane	**allant**uric	OED, AHD, W3
-alt-	1656	Latin *altus*	high	**alt**iloquent	OED, AHD, W3
-alveol-	1847	Latin *alveus, alveolus*	hollow	**alveol**iform	OED, AHD, W3
-ambl-	1598	Greek *ἀμβλύς*	blunt, dull	**ambl**ygon	OED, AHD, W3
-ambul-	1816	Latin *ambulāre*	walking	**ambul**omancy, somn**ambul**ism	OED, AHD, W3
-amm-	1879	Greek *ἄμμος*	sand	**amm**ophilous	OED, W3
-ampel-	1879	Greek *ἄμπελος*	grapevine	**ampel**ography	OED, W3
-amygdal-	1731	Greek *ἀμυγδάλη*	almond; tonsil	**amygdal**iferous, **amygdal**otomy	OED, AHD, W3
-amyl-	1865	Greek *ἄμυλος*	starch	**amyl**iferous, **amyl**ogen	OED, AHD, W3
-andr-	1849	Greek *ἀνήρ, ἀνδρος*	man; stamen	**andr**ogyny, mis**andr**y, **andr**opetalous	OED, AHD, W3
-anem-	1727	Greek *ἄνεμος*	wind	**anem**ometer	OED, AHD, W3
-angi-	1706	Greek *ἀγγεῖον*	blood vessel; seed vessel	**angi**ology, **angi**ocarpous	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-angul-	c1560	Latin *angulus*	angle	**angul**iferous, **angul**ometer, rect**angul**ar	OED, AHD, W3
-angust-	1682	Latin *angustus*	narrow	**angust**irostrate	OED, W3
-ankyl- [var. -anchyl-]	1743	Greek *ἀγκύλος*	crooked, curved	**ankyl**oglossia	OED, AHD, W3
-anth-	1640	Greek *ἄνθος*	flower	**anth**ology, gym**anth**ous	OED, AHD, W3
-anthrac-	1841	Greek *ἄνθραξ, ἄνθρακος*	carbon, coal	**anthrac**iferous, **anthrac**ometric	OED, AHD, W3
-anthrop-	1570	Greek *ἄνθρωπος*	mankind	**anthrop**ography, phil**anthrop**ic	OED, AHD, W3
-antr-	1900	Latin *antrum*	body cavity	**antr**ectomy	OED, AHD, W3
-ap-	1864	Latin *apis*	bee	**ap**iculture	OED, AHD, W3
-aphr-	1847	Greek *ἀφρός*	foam	**aphr**ometer	OED, W3
-apic-	1878	Latin *apex*, *apicis*	tip of an organ	**apic**ectomy	OED, AHD, W3
-append-, -appendic-	1894	Latin *appendere*	appendix	**append**ectomy, **appendic**ostomy	OED, AHD, W3
-apr-	1864	Latin *aper, aprum*	boar	**apr**icide	OED, W3
-aqu-	1876	Latin *aqua*	water	**aqu**apuncture, **aqu**iferous	OED, AHD, W3
-arachn-	1861	Greek *ἀράχνη*	spider	**arachn**ology	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-arae- [var. -are-]	1706	Greek *ἀραιός*	thin	**arae**ometer	OED, W3
-arbor-	1828	Latin *arbor*	tree	**arbor**iculture	OED, AHD, W3
-arch-	c980	Greek *ἄρχειν*	government, ruling	patri**arch**	OED, AHD, W3
-archae- [var. -arche-]	1865	Greek *ἀρχαῖος*	ancient, primitive	**archae**olithic, **arche**ocyte	OED, AHD, W3
-arct-	1870	Greek *ἄρκτος*	Ursa Major	**arct**ogaeal, palaeo**arct**ic	OED, AHD, W3
-are-	1877	Greek *Ἄρεος*	Mars	**are**ography	OED, W3
-aren-	1851	Latin *arēna*	sand	**aren**icolous	OED, AHD
-argyr-	1599	Greek *ἄργυρος*	silver	**argyr**ocephalous	OED, W3
-arist-	1531	Greek *ἄριστος*	best	**arist**ocracy	OED, AHD, W3
-arithm-	1577	Greek *ἀριθμός*	number	**arithm**omania	OED, AHD, W3
-arteri-	1740	Greek *ἀρτηρία*	artery	**arteri**ography	OED, AHD, W3
-arthr-	1837	Greek *ἄρθρον*	joint	**arthr**opathic	OED, AHD, W3
-asc-	1857	Greek *ἀσκός*	bag, wineskin	**asc**ophorous	OED, AHD, W3
-aster-, -astr-	1652	Greek *ἀστήρ*	star, constellation	**astr**ological, **aster**ophyllite, ge**aster**	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-astragal-	1640	Greek *ἀστραγαλός*	dice; huckle-bone	**astragal**omancy, **astragal**ectomy	OED, W3
-atm-, -atmid-	1830	Greek *ἀτμός*	air, vapor	**atm**ology, **atmid**ometer	OED, AHD, W3
-audi-	1913	Latin *audīre*	hearing	**audi**ology	OED, AHD, W3
-aul-	1731	Greek *αὐλός*	flute, pipe	**aul**ophyte	OED, W3
-aur-	c1560	Latin *aurum*	gold	**aur**ipotent	OED, AHD, W3
-aur-	1853	Latin *auris*	ear	**aur**iscope	OED, AHD, W3
-austr-	1656	Latin *auster*	south wind	**austr**omancy	OED, AHD, W3
-aut-	1665	Greek *αὐτός*	self	**aut**archy, **aut**ocarpous	OED, AHD, W3
-aux-, -auxan-	1878	Greek *αὔξειν*	increase, growing	**aux**otrophic, **auxan**ography	OED, AHD, W3
-av-	1834	Latin *avis*	bird	**av**icide	OED, AHD, W3
-axin-	1601	Greek *ἀξίνη*	axe	**axin**iform, **axin**omancy	OED, W3
-b-, -bi-	1572	Greek *βίος*	life	micro**b**ic, **bi**ometer	OED, AHD, W3
-bacc-	1656	Latin *bacca*	berry	**bacc**iferous	OED, W3
-bacteri-	1886	Greek *βακτήριον*	bacteria	**bacteri**otherapy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-balne-	1872	Latin *balneum*	bath	**balne**ologist	OED, AHD, W3
-bar-	1665	Greek *βάρος*	pressure, weight	**bar**ometer	OED, AHD, W3
-bat-	1825	Greek *βαίνειν*	walking	acro**bat**	OED, W3
-bath-	1875	Greek *βαθύς*	deep	**bath**ometer	OED, AHD, W3
-batrach-	1825	Greek *βάτραχος*	frog, toad	**batrach**ophagous	OED, AHD, W3
-bdell-	1839	Greek *βδέλλα*	leech	**bdell**ometer	OED, W3
-bell-	1635	Latin *bellum*	fight, war	**bell**ipotent	OED, AHD, W3
-bibli-	1678	Greek *βιβλίον*	book	**bibli**ography	OED, AHD, W3
-blast-	1859	Greek *βλαστός*	germ, sprout	**blast**oderm, erythro**blast**ic	OED, AHD, W3
-blenn-	1859	Greek *βλέννος*	mucus	**blenn**orrhea	OED, AHD, W3
-blephar-	1841	Greek *βλέφαρον*	eyelid	**blephar**oplasty	OED, AHD, W3
-bothr-	1835	Greek *βόθρος*	pit, trough	**bothr**enchyma	OED, W3
-botry-	1837	Greek *βότρυς, βότρυος*	bunch of grapes	**botry**ogen	OED, AHD, W3
-bov-	1678	Latin *bōs, bovis*	cow	**bov**icide	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-brach-	1589	Greek *βραχύς*	short	**brach**ylogy	OED, AHD, W3
-brach-, -brachi-	1814	Latin *brāchium*	arm	**brach**igerous, cervico**brach**ial, **brachi**opod	OED, AHD, W3
-brad-	1598	Greek *βραδύς*	slow; dull	**brad**ypepsia, **brad**yacusia	OED, AHD, W3
-branch-, -branchi-	1826	Greek *βράγχια*	gill	crypto**branch**, **branchi**opod	OED, AHD, W3
-breph-	1731	Greek *βρέφος*	foetus, infant	**breph**olatry	OED, W3
-brev-	1656	Latin *brevis*	short	**brev**iloquence	OED, AHD, W3
-bronch-	1657	Greek *βρόγχος*	throat	**bronch**ocele	OED, AHD, W3
-bront-	1731	Greek *βροντή*	thunder	**bront**ology	OED, AHD, W3
-bry-	1830	Greek *βρύον*	moss	**bry**ologist	OED, AHD, W3
-bucc-	1892	Latin *bucca*	cheek	**bucc**olingual	OED, AHD, W3
-butyr-	1863	Greek *βούτυρον*	butter	**butyr**ometer	OED, AHD
-cac-	1541	Greek *κακός*	bad, unpleasant	**cac**ochymy	OED, AHD, W3
-calam-	1873	Greek *κάλαμος*	reed	**calam**odendron	OED, AHD, W3
-calc-, -calcar-	1853	Latin *calcis, calcārius*	lime	**calc**icole, **calcar**iferous	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-call- [var. -cal-]	1613	Greek *καλός*	beauty	**call**igraphy	OED, AHD, W3
-calor-	1794	Latin *calor*	heat	**calor**imeter	OED, AHD, W3
-calyc-	1831	Greek *κάλυξ, κάλυκος*	calyx	**calyc**iform	OED, AHD, W3
-calypt-, -calyptr-	1809	Greek *καλυπτός*	covered; hidden	**calypt**oblastic, eu**calypt**us, **calyptr**ogen	OED, AHD, W3
-camp-	1606	Greek *κάμπος*	sea monster	hippo**camp**	OED, AHD
-campyl-	1835	Greek *καμπύλος*	bent	**campyl**otropous	OED, AHD, W3
-can-	1852	Latin *canis*	dog	**can**icide	OED, AHD, W3
-canth-	1860	Greek *κανθός*	corner of the eye	**canth**oplasty	OED, AHD
-capill-	1835	Latin *capillus*	hair	**capill**iform	OED, AHD, W3
-capn- [var. -kapn-]	1610	Greek *καπνός*	smoke	**capn**omancy	OED, W3
-capr-	1391	Latin *caper, caprum*	goat	**Capr**icorn	OED, AHD, W3
-caps-, -capsul-	1857	Latin *capsa, capsula*	little box, receptacle	gloeo**caps**oid, **capsul**iferous	OED, AHD, W3
-carbon-	1799	Latin *carbō*	coal	**carbon**iferous	OED, AHD, W3
-carcin-	1583	Greek *καρκίνος*	cancer	**carcin**oma	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-card-, -cardi-	1847	Greek *καρδία*	heart	tachy**card**iac, **cardi**ology	OED, AHD, W3
-carn-	1646	Latin *carō*	flesh	**carn**ivorous, muco**carn**eous	OED, AHD, W3
-carp-	1806	Greek *καρπός*	fruit	**carp**ology	OED, AHD, W3
-carp-	1870	Greek *καρπός*	wrist	**carp**opodite	OED, AHD, W3
-caud-	1839	Latin *cauda*	tail	**caud**iform, dorso**caud**al	OED, AHD, W3
-caul-	1708	Latin *caulis*	stalk, stem	**caul**iferous, **caul**orhizous	OED, AHD, W3
-cavern-	1889	Latin *caverna*	cave	**cavern**icolous	OED, AHD
-cel-	1811	Greek *κήλη*	tumor	cysto**cel**e	OED, AHD, W3
-cen- [var. -ken-]	1603	Greek *κενός*	empty	**cen**otaph, **ken**odoxy	OED, AHD, W3
-cen- [var. -cain-]	1863	Greek *καινός*	new, recent	eo**cen**e, **cain**ozoic	OED, AHD, W3
-centr-	1687	Latin *centrum*	centre	**centr**ifugal	OED, AHD, W3
-cephal-	1547	Greek *κεφαλή*	head	**cephal**algy, brachy**cephal**ic	OED, AHD, W3
-cer-, -cerat- [var. -kerat-]	c1300	Greek *κέρας, κέρατος*	horn	rhino**cer**os, **kerat**ophyte	OED, AHD, W3
-cer- [var. -ker-]	1593	Greek *κηρός*	wax	**cer**ography	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ceraun-	1827	Greek *κεραυνός*	thunderbolt	**ceraun**oscope	OED, W3
-cerc-	1572	Greek *κέρκος*	tail	**cerc**opithecus, cysti**cerc**us	OED, W3
-cerebr-	1834	Latin *cerebrum*	brain	**cerebr**iform, **cerebr**ometer, nervo**cerebr**al	OED, AHD, W3
-cerv-	1839	Latin *cervus*	deer, stag	**cerv**anthropy, hirco**cerv**us	OED, AHD, W3
-cervic-	1836	Latin *cervīx*	neck	**cervic**obranchial	OED, AHD, W3
-cet-	1836	Latin *cētus*	whale	**cet**icide, **cet**ology	OED, AHD, W3
-chaet-	1750	Greek *χαίτη*	bristle, hair	**chaet**odon, oligo**chaet**e	OED, AHD, W3
-chalc-	1646	Greek *χαλκός*	brass, copper	**chalc**anthous	OED, AHD, W3
-cheil- [var. -chil-]	1715	Greek *χεῖλος*	lip	**chil**ostomatous	OED, AHD, W3
-cheir- [var. -chir-]	1677	Greek *χείρ*	hand	**chir**ocracy	OED, AHD, W3
-chel-	1831	Greek *χηλή*	claw	**chel**icera	OED, AHD, W3
-chen-	1555	Greek *χήν*	goose	**chen**opod	OED, AHD, W3
-chiast-	1804	Greek *χιαστός*	crosslike	**chiast**olite	OED, AHD, W3
-chion-	1879	Greek *χιών*	snow	**chion**odoxa	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-chlamyd-	1836	Greek *χλαμύς, χλαμύδος*	mantle	**chlamyd**ophore	OED, AHD, W3
-chlor-	1819	Greek *χλωρός*	green	**chlor**ophyll	OED, AHD, W3
-choan-	1888	Greek *χόανος*	funnel	**choan**ocyte	OED, AHD, W3
-chol-	1845	Greek *χολή*	bile	**chol**elith, **chol**ochrome	OED, AHD, W3
-chondr-	1865	Greek *χόνδρος*	cartilage	**chondr**ogen, mito**chondr**ial	OED, AHD, W3
-chor-	1559	Greek *χώρα*	country, region	**chor**ography	OED, W3
-chor-	1880	Greek *χωρι, χωρίς*	apart, separate	**chor**ipetalous	OED, AHD, W3
-chord-	1888	Greek *χορδή*	cord, string	**chord**otonal	OED, AHD, W3
-chore-	1710	Greek *χορός*	dance	**chore**ography	OED, AHD
-chrest-	1819	Greek *χρηστός*	useful	**chrest**omathic	OED, AHD, W3
-chrom-, -chromat-	1837	Greek *χρῶμα, χρώματος*	color	**chrom**aesthesia, litho**chrom**y, **chromat**opsy	OED, AHD, W3
-chron-	1548	Greek *χρόνος*	time	**chron**ographer, plasto**chron**	OED, AHD, W3
-chrys-	c1300	Greek *χρυσός*	gold	**chrys**olite	OED, AHD, W3
-chthon-	1881	Greek *χθών*	earth, soil	**chthon**ography	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-chym-	1541	Greek *χυμός*	body fluid, humor	caco**chym**ic	OED, AHD, W3
-cid-	c1375	Latin *caedere*	cutting; killing	ligni**cid**e, homi**cid**al	OED, AHD, W3
-cion-	1874	Greek *κίων*	uvula	**cion**otomy	OED, W3
-cirs-	1708	Greek *κιρσός*	swollen vain, varix	**cirs**ocele	OED, W3
-clad-	1857	Greek *κλάδος*	shoot, sprout	**clad**enchyma, acantho**clad**ous	OED, AHD, W3
-clas-, -clast-	1641	Greek *κλάειν*	breaking	osteo**clas**is, **clast**ogen, icono**clast**ic	OED, AHD, W3
-clav-	1483	Latin *clāvis*	key	**clav**ichord	OED, AHD, W3
-cleid- [var. -clid-], -cleist- [var. -clist-]	1874	Greek *κλείειν*	closing; key	**cleist**ogamic, **cleid**omancy	OED, AHD, W3
-clin-	1811	Greek *κλίνειν*	leaning; slope	matro**clin**ous, **clin**ometer	OED, AHD, W3
-cnem-	1869	Greek *κνήμη*	shin	platy**cnem**ic	OED, W3
-cnid-	1884	Greek *κνίδη*	nettle	**cnid**oblast	OED, AHD, W3
-cocc-	1727	Greek *κόκκος*	berry, seed	**cocc**iferous, **cocc**olith, staphylo**cocc**al	OED, AHD, W3
-coel- [var. -cel-], -coeli- [var. -celi-]	1678	Greek *κοῖλος*	cavity; abdomen	**coel**ostomy, dendro**coel**ous, **coeli**otomy	OED, AHD, W3
-coen- [var. -cen-]	1638	Greek *κοινός*	common	**coen**aesthesis, **cen**obite	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-col-	1656	Latin *colere*	cultivating; inhabiting	agri**col**e, ligni**col**ous	OED, AHD, W3
-col-, -colon-	1882	Greek *κῶλον*	colon	**col**ectomy, **colon**oscopy	OED, AHD, W3
-cole-	1866	Greek *κολεός*	sheath	**cole**orhiza	OED, AHD, W3
-coll-	1835	Greek *κόλλα*	glue	**coll**enchyma	OED, AHD, W3
-color-	1863	Latin *color*	color	**color**imeter, **color**ology	OED, AHD, W3
-colp- [var. -kolp-]	1860	Greek *κόλπος*	breast; vagina	bathy**kolp**ian, **colp**ocele	OED, AHD
-com-	1836	Greek *κόμη*	hair	melano**com**ous	OED, W3
-con-	1840	Latin *cōnus*	cone	**con**irostral, **con**odont	OED, AHD, W3
-conch-	1776	Greek *κόγχη*	shell	**conch**iferous, **conch**ology	OED, AHD, W3
-condyl-	1656	Greek *κόνδυλος*	joint, knuckle	**condyl**oma	OED, AHD, W3
-coni- [var. -koni-]	1866	Greek *κόνις*	dust	**coni**ocyst, pneumo**coni**otic	OED, W3
-copr-	1829	Greek *κόπρος*	excrement; foul	**copr**olite, **copr**olalia	OED, AHD, W3
-corall-	1805	Latin *corallium*	coral	**corall**idomous	OED, AHD, W3
-corac-	1867	Greek *κόραξ, κόρακος*	crow, raven	**corac**omorphic	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-cord-	1828	Latin *cor, cordis*	heart	**cord**iform	OED, AHD, W3
-corm-	1852	Greek *κορμός*	stem, tree trunk	**corm**ophyte	OED, AHD, W3
-corn-	1650	Latin *cornū*	horn	**corn**iferous, longi**corn**	OED, AHD, W3
-cortic-	1828	Latin *cortex*	cerebral cortex	**cortic**ifugal	OED, AHD, W3
-cosm-	1678	Greek *κόσμος*	universe, world	**cosm**ogony, loxo**cosm**	OED, AHD, W3
-cost-	1852	Latin *costa*	rib	**cost**iform, lumbo**cost**al	OED, W3
-cotyl-	1897	Greek *κοτύλη*	receptacle, small vessel	**cotyl**osaur	OED, AHD, W3
-cox-	1870	Latin *coxa*	hip	**cox**opodite	OED, AHD
-crac-, -crat- [var. -krat-]	1531	Greek *κράτος*	power, strength	aristo**crac**y, **krat**ometric, physio**crat**ic	OED, AHD, W3
-cran-, -crani-	1806	Greek *κρανίον*	skull	oto**cran**ic, **crani**ology	OED, AHD, W3
-cre-, -creat-	1882	Greek *κρέως, κρέατος*	flesh	**cre**odont, **creat**ophagous	OED, AHD, W3
-crin-	1656	Latin *crīnis*	hair	**crin**igerous	OED, AHD, W3
-cross-	1861	Greek *κρόσσοι*	fringe, tassel	**cross**opterygian	OED, AHD, W3
-cruc-	1574	Latin *crux, crucis*	cross	**cruc**ifer	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-cry-	1801	Greek *κρύος*	frosty, icy cold	**cry**olite	OED, AHD, W3
-crypt- [var. -krypt-]	1641	Greek *κρυπτός*	hidden; secret	**crypt**ology, **crypt**onym	OED, AHD, W3
-crystall-	1613	Greek *κρύσταλλος*	crystal	**crystall**igerous, **crystall**omancy	OED, AHD, W3
-cten-	1872	Greek *κτείς*, *κτενός*	comb	**cten**odont	OED, AHD, W3
-cub-	1730	Latin *cubus*	cube	**cub**iform	OED, AHD, W3
-cubit-	1813	Latin *cubitum*	elbow	**cubit**odigital	OED, W3
-culic-	1894	Latin *culex, culicis*	gnat	**culic**ifuge	OED, W3
-culm-	1704	Latin *culmus*	stalk	**culm**iferous	OED, W3
-cultr-	1826	Latin *culter*	coulter, knife	**cultr**ivorous	OED, AHD
-cultur-	1603	Latin *cultūra*	cultivation	horti**cultur**e	OED, AHD, W3
-cumul-	1885	Latin *cumulus*	heap, mass	**cumul**iform, **cumul**onimbus	OED, AHD, W3
-cune-	1677	Latin *cuneus*	wedge	**cune**iform	OED, AHD, W3
-cupr-	1784	Latin *cūprum*	copper	**cupr**iferous	OED, AHD, W3
-cur-	1784	Latin *curāre*	cure	pedi**cur**e	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-curv-	1870	Latin *curvus*	bent	**curv**irostral	OED, AHD, W3
-cut-	1882	Latin *cutis*	skin	**cut**igeral	OED, AHD
-cyan-	1826	Greek *κύανος*	dark blue	**cyan**ogen	OED, AHD, W3
-cyath-	1776	Greek *κύαθος*	cup	**cyath**iform, **cyath**olith	OED, W3
-cycl-	1815	Greek *κύκλος*	circle	**cycl**ometer	OED, AHD, W3
-cyesi-	1846	Greek *κύησις*	pregnancy	**cyesi**ology	OED, W3
-cym- [var. -kym-]	1804	Greek *κῦμα*	wave	**cym**ophane	OED, AHD, W3
-cyn-	1706	Greek *κύων*, *κυνός*	dog	**cyn**orhodon	OED, AHD, W3
-cyprin-	1867	Greek *κυπρίνος*	carp	**cyprin**odont	OED, AHD
-cyrt-	1867	Greek *κυρτός*	arched, curved	**cyrt**olite	OED, W3
-cyst-	1839	Greek *κύστις*	bladder	**cyst**algia	OED, AHD, W3
-cyt-	1842	Greek *κύτος*	cell	**cyt**oblast, leuco**cyt**e	OED, AHD, W3
-dacry-	1847	Greek *δάκρυ*	tear	**dacry**olith	OED, W3
-dactyl-	1721	Greek *δάκτυλος*	finger	**dactyl**onomy, artio**dactyl**	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-dactyli-	1850	Greek *δακτύλιος*	finger-ring, gem	**dactyli**ographic	OED, W3
-das-	1875	Greek *δασύς*	hairy; density	**das**ypygal, **das**ymeter	OED, AHD, W3
-de-	1611	Latin *deus*	god	**de**icide	OED, AHD, W3
-deipn-	1656	Greek *δεῖπνον*	dinner	**deipn**osophist	OED, W3
-del-	1882	Greek *δῆλος*	visible	**del**omorphic, uro**del**e	OED, W3
-dem-	1531	Greek *δῆμος*	people	**dem**ocracy	OED, AHD, W3
-dendr-	1708	Greek *δένδρον*	tree	**dendr**ology	OED, AHD, W3
-dent-	1708	Latin *dēns*, *dentis*	tooth	**dent**iform, apico**dent**al	OED, AHD, W3
-derm-, -dermat-	1851	Greek *δέρμα, δέρματος*	skin	**derm**ography, pachy**derm**ia, **dermat**algia, sclero**dermat**ous	OED, AHD, W3
-des-, -desm-	1854	Greek *δέσις, δεσμός*	binding; ligament	irido**des**is, **desm**ology	OED, W3
-dextr-	1876	Latin *dexter, dextra*	on the right	**dextr**ogyre	OED, AHD, W3
-diabol-	1845	Greek *διάβολος*	devil	**diabol**arch, **diabol**ology	OED, AHD, W3
-dial-	1849	Greek *διαλύειν*	separated	**dial**ypetalous	OED, AHD, W3
-dicty-	1846	Greek *δίκτυον*	net	**dicty**ogen	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-didact-	1534	Greek *διδάσκειν*	teaching	auto**didact**	OED, AHD, W3
-digit-	1846	Latin *digitus*	finger	**digit**iform, ortho**digit**al	OED, AHD, W3
-din- [var. -dein-]	1841	Greek *δεινός*	mighty, terrible	**din**osaur	OED, AHD, W3
-dips-	1843	Greek *δίψα*	thirst	**dips**omania	OED, AHD
-disc-	1830	Latin *discus*	disk; recording	**disc**iform, **disc**ophorous, cephalo**disc**us, **disc**ography	OED, AHD, W3
-docim-	1847	Greek *δοκιμή*	examination, scrutiny	**docim**ology	OED, W3
-dolich-	1849	Greek *δολιχός*	long	**dolich**ocephalic	OED, AHD, W3
-dom-	1846	Greek *δόμος*	house	**dom**iculture, opistho**dom**e	OED, AHD
-dor-	1952	Greek *δόρυ*	spear	**dor**yphore	OED, W3
-dors-	1727	Latin *dorsum*	back	**dors**iferous, **dors**ocaudal	OED, AHD, W3
-dox-	1649	Greek *δόξα*	opinion	**dox**ology, caco**dox**y	OED, AHD
-drom-	1549	Greek *δρόμος*	race	**drom**ometry, hippo**drom**e	OED, AHD, W3
-dros-	1825	Greek *δρόσος*	dew	**dros**ometer	OED, AHD
-dry-	1862	Greek *δρῦς, δρυός*	oak	**Dry**opithecus	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-dul- [var. -doul-]	1656	Greek *δοῦλος*	slave	**dul**ocracy	OED, W3
-dynam-	1810	Greek *δύναμις*	force, power	**dynam**ometer, aero**dynam**ic	OED, AHD, W3
-dyt-	1555	Greek *δύειν*	entering	troglo**dyt**e	OED, AHD, W3
-e-	1890	Greek *ἕως*	earliest	**e**olithic	OED, AHD, W3
-ec- [var. -oec-]	1876	Greek *οἶκος*	dwelling, house	**ec**ology	OED, AHD, W3
-ecclesi-	1781	Greek *ἐκκλησία*	church	**ecclesi**arch	OED, AHD, W3
-ech-	1736	Greek *ἠχύ*	sound	**ech**ometer	OED, AHD, W3
-echin-	1813	Greek *ἔχῖνος*	prickle	**echin**oderma	OED, AHD, W3
-ectom-	1882	Greek *ἐκτομή*	cutting out	hyster**ectom**y	OED, AHD, W3
-ectr-	1848	Greek *ἔκτρωσις*	congenital absence	**ectr**odactyly	OED, W3
-eid-	1801	Greek *εἶδος*	figure, image	**eid**ograph	OED, AHD, W3
-elae- [var. -elai-]	1816	Greek *ἔλαιον*	oil	**elae**olite, **elai**oplast	OED, W3
-eleuther-	1813	Greek *ἐλεύθερος*	freedom	**eleuther**arch	OED, W3
-elytr-	1835	Greek *ἔλυτρον*	sheath; vagina	**elytr**iform, **elytr**oplasty	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-embry-	1835	Greek *ἔμβρυον*	embryo	**embry**ogeny	OED, AHD, W3
-emes-, -emet-	1800	Greek *ἔμετος*	vomiting	hemat**emes**is, **emet**ology	OED, AHD
-emmen-	1702	Greek *ἔμμηνα*	menses	**emmen**agogue	OED, AHD
-enanti-	1830	Greek *ἐναντίος*	opposite	**enanti**opathic	OED, AHD, W3
-encephal-	1824	Greek *ἐγκέφαλος*	brain	**encephal**ology, rhin**encephal**ic	OED, AHD, W3
-enchym-	1887	Greek *ἔγχυμα*	cellular tissue	cyst**enchym**e	OED, AHD, W3
-ens-	1541	Latin *ēnsis*	sword	**ens**iform	OED, AHD
-enter-	1661	Greek *ἔντερον*	intestine	**enter**ocele, gastr**enter**ic	OED, AHD, W3
-entom-	1839	Greek *ἔντομα*	insect	**entom**ophagous	OED, AHD, W3
-epeir-	1890	Greek *ἤπειρος*	continent	**epeir**ogeny	OED, AHD
-episi-	1872	Greek *ἐπίσειον*	pubic region	**episi**orrhaphy	OED, AHD, W3
-erg-, -ergat-, -urg-	1879	Greek *ἔργον, ἐργάτης*	work	**erg**ometer, **ergat**ocracy, metall**urg**y	OED, AHD, W3
-eri-	1829	Greek *ἔριον*	wool	**eri**ometer	OED, W3
-eruc-	1874	Latin *ērūca*	caterpillar	**eruc**iform	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-erythr-	1846	Greek *ἐρυθρός*	red; red cell	**erythr**ogen, **erythr**aemia	OED, AHD, W3
-esthes- [var. -aesthes-], -esthesi- [var. -aesthesi-], -esthi- [var. -aesthi-]	1831	Greek *αἴσθησις*	perception, sensation	radi**esthes**ia, **aesthesi**ogenic, **aesthi**ology	OED, AHD, W3
-eth-	1656	Greek *ἦθος*	character	**eth**opoeia	OED, AHD
-ethn-	1834	Greek *ἔθνος*	race	**ethn**ography	OED, AHD, W3
-eti-	1830	Greek *αἰτία*	cause	**eti**ologist	OED, AHD, W3
-eur-	1866	Greek *εὐρύς*	broad, wide	**eur**ygnatous	OED, AHD, W3
-febr-	1663	Latin *febris*	fever	**febr**ifugal	OED, AHD, W3
-fel-	1832	Latin *fēlis*	cat	**fel**icide	OED, AHD
-femin-	1820	Latin *fēmina*	woman	**femin**ivorous	OED, AHD, W3
-femor-	1831	Latin *femur*	thigh	**femor**ocele, coxo**femor**al	OED, AHD, W3
-fer-	c1611	Latin *ferre*	bearing, carrying	voci**fer**ous	OED, AHD, W3
-ferr-	1811	Latin *ferrum*	iron	**ferr**ivorous	OED, AHD, W3
-fet- [var. -foet-]	1656	Latin *fētus*	unborn offspring	**foet**iferous, onco**fet**al	OED, AHD, W3
-fil-	1757	Latin *fīlum*	thread	**fil**iform	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-fiss-	1835	Latin *findere*	cleft, divided	**fiss**irostral	OED, AHD, W3
-flav-	1727	Latin *flāvus*	yellow	**flav**icomous	OED, AHD, W3
-flor-	1656	Latin *flōs, flōris*	flower	**flor**igerous, nocti**flor**ous	OED, AHD, W3
-fluv-, -fluvi-	1848	Latin *fluvius*	river, stream	glacio**fluv**ial, **fluvi**ometer	OED, AHD, W3
-foli-	1828	Latin *folium*	leaf	**foli**iparous, gramini**foli**ous	OED, AHD, W3
-form	1541	Latin *forma*	configuration, shape	ensi**form**	OED, AHD, W3
-frag-	1526	Latin *frangere*	breaking	saxi**frag**e	OED, AHD
-fratr-	c1450	Latin *frāter*	brother	**fratr**icide	OED, AHD, W3
-frig-	1664	Latin *frīgus*	cold	**frig**iferous	OED, AHD, W3
-front-	1839	Latin *frōns*, *frontis*	forehead	**front**oparietal, naso**front**al	OED, AHD, W3
-fruct-	1632	Latin *frūctus*	fruit	**fruct**ivorous	OED, AHD, W3
-fug-	1654	Latin *fugere, fugāre*	fleeing; repelling	luci**fug**ous, vermi**fug**e	OED, AHD, W3
-fum-	1656	Latin *fūmus*	smoke	**fum**iferous	OED, AHD
-fun-, -funil-	1606	Latin *fūnis, fūnīlis*	rope	**fun**ambule, **funil**iform	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-fung-	1765	Latin *fungus*	fungus	**fung**iferous	OED, AHD, W3
-fus-	1746	Latin *fūsus*	spindle	**fus**iform	OED, AHD, W3
-galact-	1661	Greek *γάλακτος*	milk	**galact**ophagist, oligo**galact**ia	OED, AHD, W3
-gale-	1835	Greek *γαλέη*	weasel	**gale**opithecus	OED, W3
-gam-	1830	Greek *γάμος*	marriage; union	**gam**omania, hiero**gam**y, **gam**opetalous, karyo**gam**y	OED, AHD, W3
-gaster-, -gastr-	1804	Greek *γαστήρ*, *γαστρός*	stomach	**gaster**opodous, pneo**gaster**, **gastr**odynia, caco**gastr**ic	OED, AHD, W3
-ge-	1362	Greek *γῆ*	earth, ground	**ge**omancy, arcto**gae**al	OED, AHD, W3
-gen-	1847	Latin *genū*	knee	**gen**uform	OED, AHD
-gen-, -gene-, -genes-, -genet-	1877	Greek *γένος*, *γένεσις*	generating, producing; ancestry, race	**gen**oblast, onco**gen**ic, partheno**genes**is, cyto**genet**ic, **gen**ocidal, **gene**alogy	OED, AHD, W3
-geni-	1669	Greek *γένειον*	chin	**geni**oglossal	OED, W3
-ger-	1731	Latin *gerere*	bearing	belli**ger**ous	OED, AHD, W3
-ger-, -geront-	1830	Greek *γήρως, γέροντος*	old age; old person	**ger**iatric, phylo**geront**ic, **geront**ocracy	OED, AHD, W3
-geus-, -geust-	1848	Greek *γεύεσθαι*	taste	oxy**geus**ia, pseudo**geust**ia	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-gigant-	1606	Greek *γίγας, γιγαντος*	giant	**gigant**omachy	OED, AHD, W3
-glaci-	1886	Latin *glaciēs*	ice	**glaci**ologist	OED, AHD, W3
-glauc-	1827	Greek *γλανκός*	grey	**glauc**olite	OED, AHD, W3
-glob-	1786	Latin *globus*	globe	**glob**iferous	OED, AHD, W3
-gloe- [var. -gloi-]	1857	Greek *γλοιός*	glue	**gloe**ocapsoid, **gloi**ocarp	OED, W3
-gloss- [var. -glott-], -glot-	1607	Greek *γλώσσα, γλώττα*	tongue; language	anthropo**glot**, **glott**ographer, **gloss**ology, mylo**gloss**us	OED, AHD, W3
-gluc-, -glyc-	1852	Greek *γλυκύς*	sweet	**gluc**olysis, **glyc**emia	OED, AHD, W3
-glyph-, -glypt-	1623	Greek *γλύφίς, γλυπτικός*	carving, engraving	**glyph**ography, litho**glyph**ic, **glypt**ograph	OED, AHD, W3
-gnath-	1878	Greek *γνάθος*	jaw	**gnath**ophorous, eury**gnath**ous	OED, AHD, W3
-gnom-, -gnos-, -gnosi-, -gnost-	1560	Greek *γνώμων, γνῶσις, γνωστικός*	cognition, knowledge	**gnom**ograph, hydro**gnos**y, patho**gnom**y, **gnosi**ology, **gnost**ology	OED, AHD, W3
-gon-	1547	Greek *γόνος*	seed; begetting	**gon**orrhoea, cosmo**gon**y	OED, AHD, W3
-gon-, -goni-	c1560	Greek *γωνία*	angle	ortho**gon**al, **goni**oscope	OED, AHD, W3
-grad-	1827	Latin *gradī*	walking	digiti**grad**e	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-gram-, -gramm-	1852	Greek *γράμμα, γράμματος*	written	**gram**ophone, thermo**gram**, chrono**gramm**ic	OED, AHD, W3
-gramin-	1739	Latin *grāmen*	grass	**gramin**iferous	OED, AHD, W3
-gran-	1646	Latin *grānum*	grain	**gran**ivorous	OED, AHD, W3
-graph-	1696	Greek *γράφειν*	writing	**graph**ometer, steno**graph**ic	OED, AHD, W3
-grav-	1727	Latin *gravis*	heavy	**grav**isonous	OED, AHD, W3
-griph-	1597	Greek *γρῖφος*	riddle	logo**griph**	OED, AHD
-gymn-	1842	Greek *γυμνός*	naked; bare	**gymn**opaedic, **gymn**anthous	OED, AHD, W3
-gyn-, -gynec- [var. -gynaec-]	1623	Greek *γυνή, γυναικός*	woman	**gyn**ophilous, **gynec**andrical, **gynaec**olatry	OED, AHD, W3
-gyr-	1557	Greek *γῦρος*	circle	**gyr**omancy, dextro**gyr**e	OED, AHD, W3
-habr-	1854	Greek *ἁβρός*	graceful	**habr**omania	OED, W3
-hadr-	1859	Greek *ἁδρός*	thick, stout	**hadr**osaur	OED, AHD, W3
-hagi-	1585	Greek *ἅγιος*	holy	**hagi**ographical	OED, AHD, W3
-hal-, -hali-	1727	Greek *ἅλς, ἁλός*	salt; sea	**hal**imetry, oligo**hal**ine, **hali**ography	OED, AHD, W3
-hapt-	1892	Greek *ἅπτειν*	binding	**hapt**otropic	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-hedon-	c1866	Greek *ἡδονή*	pleasure	**hedon**ology	OED, AHD
-hedr-	1837	Greek *ἕδρα*	surface	holo**hedr**al	OED, AHD, W3
-hel-	1854	Greek *ἕλος, ἕλεος*	marsh	**hel**obious	OED, W3
-hel-	1854	Greek *ἧλος*	nail, stud	**hel**ocerous	OED, W3
-heli-	1675	Greek *ἥλιος*	sun	**heli**oscope,	OED, AHD, W3
-helic-	1706	Greek *ἕλιξ, ἕλικος*	spiral	**helic**ometry	OED, AHD, W3
-helminth-	1819	Greek *ἕλμινς*	intestinal worm	**helminth**ology, nemat**helminth**	OED, AHD, W3
-hem- [var. -haem-], -hemat- [var. -haemat-]	1671	Greek *αἷμα, αἵματος*	blood	**hem**orrhage, pachy**haem**ia, **haemat**uria	OED, AHD, W3
-hemer-	1656	Greek *ἡμέρα*	day	**hemer**ology, nycto**hemer**al	OED, AHD
-hepat-	1712	Greek *ἧπαρ, ἥπατος*	live	**hepat**oscopy	OED, AHD, W3
-hered-	1855	Latin *hērēdium*	legacy	**hered**ipety	OED, AHD, W3
-herni-	1811	Latin *hernia*	hernia	**herni**otomy	OED, AHD, W3
-herpet-	1854	Greek *ἑρπετόν*	reptile; herpes	**herpet**otomy, **herpet**ography	OED, AHD, W3
-hier-	1585	Greek *ἱερός*	holy, sacred	**hier**oglyphic	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-hipp-	1646	Greek *ἵππος*	horse	**hipp**iatric, Oro**hipp**us	OED, AHD, W3
-hirc-	1398	Latin *hircus*	male goat	**hirc**ocervus	OED, AHD
-hirudin-	1861	Latin *hirūdō*, *hirūdinem*	leech	**hirudin**iculture	OED, AHD
-hist-, -histi-	1847	Greek *ἱστός*, *ἱστίον*	tissue; web	**hist**ology, **histi**ocytic, **hist**ogram	OED, AHD, W3
-hod- [var. -od-]	1730	Greek *ὁδός*	way	**hod**ometrical	OED, W3
-hol-	1623	Greek *ὅλος*	whole	**hol**ograph	OED, AHD, W3
-hom-, -homin-	c1375	Latin *homō*, *hominem*	human	**hom**icide, **homin**ivorous	OED, AHD, W3
-homal-	1864	Greek *ὁμαλός*	ordinary	**homal**ographic	OED, W3
-hopl- [var. -opl-]	1650	Greek *ὅπλον*	armor, weapon	**hopl**omachist	OED, AHD, W3
-hor-	c1050	Greek *ὥρα*	hour; clock	**hor**oscope, **hor**ologer	OED, AHD, W3
-hort-	1678	Latin *hortus*	garden	**hort**iculture	OED, AHD, W3
-hyal-	1854	Greek *ὕαλος*	glass; transparent	**hyal**ography, **hyal**opterous	OED, AHD, W3
-hydr-	1597	Greek *ὕδωρ*	water	**hydr**ocele, steno**hydr**ic	OED, AHD, W3
-hyet-	1730	Greek *ὑετός*	rain	**hyet**ometer	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-hygi- [var. -hygei-]	1882	Greek *ὑγεία*	health	**hygei**olatry	OED, AHD
-hygr-	1665	Greek *ὑγρός*	humid, wet	**hygr**oscope	OED, AHD, W3
-hyl-	1655	Greek *ὕλη*	forest; wood	**hyl**obian, **hyl**ophagous	OED, AHD, W3
-hymen-	1813	Greek *ὑμήν*	membrane	**hymen**opterous	OED, AHD
-hyph-	1836	Greek *ὕφος*	web	**hyph**omycetous	OED, AHD, W3
-hypn-	1833	Greek *ὕπνος*	sleep	**hypn**ology	OED, AHD, W3
-hyps-	1570	Greek *ὕψος*	height	**hyps**icephalic, **hyps**ometry	OED, AHD, W3
-hyster-	1706	Greek *ὑστέρα*	uterus, womb	**hyster**otomy	OED, AHD, W3
-iatr-	1843	Greek *ἰατρός*	physician	**iatr**archy, bar**iatr**ics	OED, AHD, W3
-ichn-	1598	Greek *ἴχνος*	footprint, track	**ichn**ography	OED, AHD, W3
-ichor-, -ichorr-	1854	Greek *ἰχώρ*	fluid	petr**ichor**, **ichorr**haemia	OED, AHD
-ichthy-	1555	Greek *ἰχθύς, ἰχθύος*	fish	**ichthy**ophagy	OED, AHD, W3
-icon-	1581	Greek *εἰκών*	image	**icon**omachy	OED, AHD, W3
-icter-	1897	Greek *ἴκτερος*	jaundice	**icter**ogenic	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ide-	1797	Greek *ἰδέα*	idea	**ide**ologist	OED, AHD, W3
-idol-	c1380	Greek *εἴδωλον*	idol	**idol**ater	OED, AHD, W3
-ign-	1618	Latin *ignis*	fire	**ign**iferous	OED, AHD, W3
-insect-	1611	Latin *īnsectum*	insect	**insect**ivorous	OED, AHD, W3
-irid-	1822	Greek *ἶρις, ἴριδος*	iris of the eye	**irid**ectomia	OED, AHD, W3
-ischi-	1847	Greek *ἴσχιον*	hip joint	**ischi**algia	OED, AHD, W3
-ith-	c1693	Greek *ἰθύς*	erect, straight	**ith**yphallian	OED, AHD
-kary- [var. -cary-]	1883	Greek *κάρυον*	nut; nucleus of a cell	**cary**opsis, **kary**olysis	OED, AHD, W3
-kin- [var. -cin-], -kine- -kinemat- [var. -cinemat-], -kines- [var. -cines-], -kinesi-, -kinet- [var. -cines-]	1880	Greek *κίνησις, κινητός*	motion	**kin**aesthesis, **kine**ograph, **cinemat**oscope, karyo**kines**is **kinesi**ology, **kinet**ograph	OED, AHD, W3
-klept-	1819	Greek *κλέπτειν*	stealing	**klept**ocracy, biblio**klept**	OED, AHD, W3
-kym-	1867	Greek *κῦμα*	wave	**kym**ograph	OED, AHD
-labi-	1669	Latin *labium*	lip	**labi**odental	OED, AHD, W3
-lachrym-	1866	Latin *lacrima*	tear	**lachrym**iform, **lachrym**ogenic	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-lact-	1673	Latin *lac*, *lactis*	milk	**lact**iferous, **lact**ometer	OED, AHD, W3
-lag-	1656	Greek *λαγώς*	hare	**lag**ophthalmy	OED, AHD, W3
-lagn-	1906	Greek *λαγνεία*	lust, sexual drive	uro**lagn**ic	OED, AHD
-lal-	1885	Greek *λαλειν*	chatter, speech	echo**lal**ia	OED, AHD, W3
-lamell-	1819	Latin *lāmella*	thin layer	**lamell**iform	OED, AHD, W3
-lampad-, -lampr-	1652	Greek *λαμπάς, λαμπάδος, λαμπρός*	bright; torch	**lampr**ophony, **lampad**omancy	OED, W3
-lan-	1608	Latin *lāna*	wool	**lan**igerous	OED, AHD, W3
-lap-	1592	Latin *lapis*, *lapidis*	stone	**lap**icide	OED, AHD
-lapar-	1802	Greek *λαπάρα*	abdominal wall	**lapar**ocele	OED, AHD
-larv-	1815	Latin *larva*	larva	**larv**iparous	OED, AHD, W3
-laryng-	1661	Greek *λάρυγξ*	larynx	**laryng**otomy	OED, AHD, W3
-lat-	1646	Latin *lātus*	broad, wide	**lat**irostrous	OED, AHD
-later-	1658	Latin *latus*, *lateris*	side	**later**ifolious, longi**later**al	OED, AHD, W3
-latr-	c1250	Greek *λατρεία*	worship	ido**latr**y	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-lecith-	1950	Greek *λέκιθος*	yolk of egg	**lecith**otrophic	OED, AHD, W3
-lei-	1855	Greek *λεῖος*	smooth	**lei**otrichous	OED, W3
-lep-, -lepid-, -lept-	1769	Greek *λεπίς*, *λεπίδος*, *λεπτός*	scale; fine, thin	**lep**ocyte, **lepid**opterous, **lept**ocephalus	OED, AHD, W3
-leps-, -lept-	1727	Greek *λῆψις*, *ληπτικός*	seizure	andro**leps**y, psycho**lept**ic	OED, AHD, W3
-leuc- [var. -leuk-]	1742	Greek *λευκός*	white	**leuc**orrhoea	OED, AHD, W3
-lev- [var. -laev-]	1856	Latin *laevus*	on the left	**laev**ogyrous	OED, AHD, W3
-lex-, -lexic-	1658	Greek *λέξις*, *λεξικόν*	diction, word	**lex**igram, **lexic**ographer	OED, AHD, W3
-libr-	1856	Latin *liber*, *libri*	book	**libr**icide	OED, AHD
-lign-	1656	Latin *lignum*	wood	**lign**icide	OED, AHD, W3
-lim-	1888	Latin *līmus*	mud	**lim**icolous	OED, AHD
-limn-	1852	Greek *λίμνη*	lake, marsh	**limn**ometer, bathy**limn**etic	OED, AHD, W3
-lin-	1878	Latin *līnum*	flax	**lin**oleum	OED, AHD
-line-	1858	Latin *līnea*	cord, line	**line**ograph	OED, W3
-lingu-	1753	Latin *lingua*	tongue	**lingu**iform, denti**lingu**al	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-lip-	1711	Greek *λείπειν*	lacking	**lip**ogram	OED, W3
-lip-, -lipar-	1830	Greek *λίπος, λιπαρός*	fat	**lip**ectomy, **lipar**ocele	OED, AHD, W3
-liss-	1859	Greek *λισσός*	smooth	**liss**encephalous	OED, W3
-lit-, -lith-	1685	Greek *λίθος*	stone; calculus	cero**lit**e, **lith**ography, nephro**lith**ic	OED, AHD, W3
-lob-	1911	Greek *λοβός*	lobe of an organ	**lob**ectomy	OED, AHD, W3
-loc-	1612	Latin *locus*	place	**loc**omotive	OED, AHD, W3
-log-	c1300	Greek *λέγειν*	speech, word; science	**log**omachy, genea**log**y	OED, AHD, W3
-long-	1646	Latin *longus*	long	**long**imanous	OED, AHD, W3
-loph-, -lophi-	1850	Greek *λόφος*	crest	**loph**ophore, **lophi**odont	OED, W3
-loqu-	1584	Latin *loquī*	speaking	ventri**loqu**y	OED, AHD
-lox-	1656	Greek *λόξος*	oblique	**lox**odromy	OED, AHD, W3
-luc-	c1050	Latin *lūx*, *lūcis*	light	**Luc**ifer	OED, AHD, W3
-lucr-	1648	Latin *lucrum*	gain, profit	**lucr**ipetous	OED, AHD
-luct-	1656	Latin *luctus*	grief, sorrow	**luct**iferous	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-lum-, -lumin-	1801	Latin *lūmen*, *lūminis*	light	**lum**ichrome, **lumin**iferous	OED, AHD, W3
-lumb-	1854	Latin *lumbus*	loin	**lumb**odynia, dorso**lumb**ar	OED, AHD, W3
-lun-	1686	Latin *lūna*	moon	**lun**iform, novi**lun**ar	OED, AHD
-lute-	1861	Latin *lūteus*	yellowish	**lute**otrophic	OED, AHD, W3
-ly-, -lys-, -lyt-	1578	Greek *λύειν*	loosening; dissolving	**ly**ophile, **lys**imachia, hydro**lys**is, pyro**lyt**ic	OED, AHD, W3
-lyc-	1584	Greek *λύκος*	wolf	**lyc**anthropy	OED, AHD, W3
-lymp-	1856	Latin *lympha*	lymph	**lymph**ogenous	OED, AHD, W3
-mach-	1569	Greek *μάχεσθαι*	battle, fight	logo**mach**y	OED, AHD, W3
-macr-	c1500	Greek *μακρός*	large	**macr**odont, **macr**ocosm	OED, AHD, W3
-macul-	1863	Latin *macula*	blemish, spot	**macul**iferous	OED, AHD, W3
-magn-	1599	Latin *magnus*	great	**magn**ipotent	OED, AHD, W3
-malac-	1790	Greek *μαλακός*	soft	**malac**oderm, osteo**malac**ia	OED, AHD, W3
-man-	1646	Latin *manus*	hand	**man**ichord, longi**man**ous	OED, AHD, W3
-man-	1693	Greek *μανία*	madness; excessive desire	typho**man**ia, nympho**man**ia	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-manc-, -mant-	1362	Greek *μαντεία*	divination, prophesy	geo**manc**y, **mant**ology, ono**mant**ic	OED, AHD, W3
-mar-	1867	Latin *mare*	sea	**mar**icolous	OED, AHD, W3
-mast-, -maz-	1809	Greek *μαστός*, *μαζός*	breast	**mast**odon, gynaeco**mast**y, **maz**odynia, pleio**maz**ia	OED, AHD, W3
-mastig-	1658	Greek *μάστιξ*, *μάστιγος*	scourge, whip	**mastig**ophore	OED, AHD, W3
-math-	1819	Greek *μαθειν*	learning	chresto**math**ic	OED, AHD
-matr-	1594	Latin *māter*, *mātris*	mother	**matr**icide, **matr**onymical	OED, AHD, W3
-mec-	1570	Greek *μῆκος*	length	**mec**ometry	OED, W3
-megal-	1579	Greek *μέγας*, *μεγάλου*	great	**megal**opolis, acro**megal**y	OED, AHD, W3
-mel-, -mell-	c1400	Greek *μέλι*	honey	hydro**mel**, **mell**iphagous	OED, AHD, W3
-mel-	1721	Greek *μέλος*	limb; melody, song	**mel**algia, **mel**opoeia	OED, AHD, W3
-mel-	1848	Greek *μῆλον*	cheek	**mel**oplasty	OED, W3
-melan-	1836	Greek *μέλας*, *μέλανος*	black	**melan**ocomous, lepido**melan**e	OED, AHD, W3
-men-	1779	Greek *μήν*	menstruation	**men**orrhagia	OED, AHD
-men-	1899	Greek *μένειν*	remaining	**men**orhynchous	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ment-	1721	Latin *mēns*, *mentis*	mind	**ment**iculture	OED, AHD, W3
-ment-	1833	Latin *mentum*	chin	**ment**olabial	OED, W3
-mer-	1652	Greek *μέρος*	part	**mer**ocracy, gono**mer**y	OED, AHD, W3
-mer-	1802	Greek *μηρός*	thigh	**mer**ocele	OED, W3
-mes-	1579	Greek *μέσος*	middle	**mes**ograph	OED, AHD, W3
-meteor-	1736	Greek *μετέωρος*	meteor	**meteo**rography, hydro**meteor**	OED, AHD, W3
-metop-	1569	Greek *μέτωπον*	forehead	**metop**oscopy	OED, AHD
-metr-	c1500	Greek *μήτηρ*, *μητρός*, *μήτρα*	mother; uterus	**metr**opole, **metr**orrhagia	OED, AHD, W3
-metr-	1624	Greek *μέτρον*	measure	**metr**onome, baro**metr**ic	OED, AHD, W3
-mi- [var. -mei-]	1831	Greek *μείων*	lesser	**mi**ocene	OED, AHD, W3
-miasm-	1883	Greek *μίασμα*	putrefaction	**miasm**ifuge, **miasm**ology	OED, AHD
-micr-	c1475	Greek *μικρός*	small	**micr**ocosm	OED, AHD, W3
-mim-	1638	Greek *μῖμος*	mime	**mim**ographer	OED, AHD, W3
-mis-	1560	Greek *μισειν*	hatred	**mis**ogamy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-mit-	1901	Greek *μίτος*	thread	**mit**ochondrial	OED, AHD, W3
-mix-	1876	Greek *μῖξις*	mixing	**mix**oscope	OED, AHD, W3
-mnem-, -mnes-	1845	Greek *μνήμη*, *μνήσκειν*	memory	**mnem**otechny, crypto**mnes**ic	OED, AHD, W3
-mog-	1857	Greek *μόγις*	difficultly	**mog**igraphy	OED, W3
-molybd-	1697	Greek *μόλυβδος*	lead	**molybd**omancy	OED, AHD, W3
-morph-	c1617	Greek *μορφή*	form, shape	**morph**oscopic, anthropo**morph**ist	OED, AHD, W3
-mot-	1865	Latin *mōtus*	motion	**mot**ograph, auto**mot**ive	OED, AHD, W3
-muc-	1754	Latin *mūcus*	mucus	**muc**ocarneous	OED, AHD, W3
-mur-	1861	Latin *mūs*, *mūris*	mouse	**mur**icide	OED, AHD
-musc-	1818	Latin *muscus*	moss	**musc**icolous, **musc**ology	OED, W3
-musc-	1857	Latin *musca*	fly	**musc**iform	OED, AHD, W3
-my-	1649	Greek *μῦς*, *μυός*	muscle; mouse	**my**ology, **my**omorphic	OED, AHD, W3
-myc-, -mycet-	1885	Greek *μύκης*, *μύκητος*	mushroom; fungus	**myc**ophile, **mycet**ology, **myc**odermic, phyco**mycet**ous	OED, AHD, W3
-myel-	1848	Greek *μυελός*	bone marrow; spinal cord	**myel**ogenous, osteo**myel**itis, **myel**omalacia	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-myl-	1657	Greek *μύλη*	molar	**myl**oglossus	OED, W3
-myri-	1857	Greek *μύριος*	numerous	**myri**anthous	OED, AHD, W3
-myrmec-	1840	Greek *μύρμηξ, μύρμηκος*	ant	**myrmec**ophagous	OED, AHD, W3
-mys-	1879	Greek *μύσος*	filth, uncleanness	**mys**ophobia	OED, AHD
-myth-	c1425	Greek *μῦθος*	fable	**myth**ology	OED, AHD, W3
-mytil-	1854	Greek *μυτίλος*	mussel	**mytil**iform	OED, W3
-myx-	1802	Greek *μύξα*	mucus, slime	**myx**opod	OED, AHD, W3
-myz-	1871	Greek *μύζειν*	sucking	**myz**ostome, Petro**myz**on	OED, W3
-narc-	1865	Greek *νάρκη*	sleep	**narc**omania	OED, AHD, W3
-nas-	1646	Latin *nāsus*	nose	**nas**icornous, **nas**ology, bucco**nas**al	OED, AHD, W3
-nast-	1906	Greek *νάσσειν*	squeezing together	nycti**nast**ic	OED, AHD, W3
-naut-	1754	Greek *ναύτης*	sailing	aero**naut**ic	OED, AHD, W3
-ne-	c1425	Greek *νέος*	new	**ne**ophyte	OED, AHD, W3
-necr- [var. -nekr-]	c1456	Greek *νεκρός*	corpse; death	**necr**omancy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-nect-	1658	Greek *νηκτόν*	swimming	**nect**opod, Noto**nect**a	OED, W3
-negr-	1783	Latin *niger*	black	**negr**omania	OED, AHD, W3
-nem-, -nemat-	1857	Greek *νῆμα*, *νήματος*	thread	**nem**ocerous, chromo**nem**a, **nemat**oblast	OED, AHD, W3
-neph-, -nephel-	1816	Greek *νεφέλη*	cloud	**neph**oscope, **nephel**ognosy	OED, AHD, W3
-nephr-	1697	Greek *νεφρός*	kidney	**nephr**otomy, meso**nephr**ic	OED, AHD, W3
-nerv-	1665	Latin *nervus*	nerve	**nerv**ifolious, **nerv**ocerebral	OED, AHD, W3
-nes-	1845	Greek *νῆσος*	island	Austro**nes**ia	OED, AHD, W3
-neur-	1681	Greek *νεῦρον*	nerve	**neur**ology, angio**neur**otic	OED, AHD, W3
-nid-	1902	Latin *nīdus*	nest	**nid**icolous	OED, AHD
-nimb-	1880	Latin *nimbus*	cloud	**nimb**ostratus, cumulo**nimb**us	OED, AHD, W3
-no-	1817	Greek *νόος*	mind	**no**oscopic	OED, W3
-noct-	1656	Latin *nox, noctis*	night	**noct**iferous, **noct**ograph	OED, AHD, W3
-nom-	1205	Greek *νόμος*	arrangement, order	**nom**otechnic, astro**nom**y	OED, AHD, W3
-nos-	1654	Greek *νόσος*	disease	**nos**ography	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-not-	1658	Greek *νῶτος*	back	**Not**onecta	OED, AHD, W3
-not-	1868	Greek *νότος*	south	**Not**ogaea	OED, AHD, W3
-noth-	1843	Greek *νόθος*	cross-bred	**noth**osaur	OED, W3
-nov-	1686	Latin *novus*	new	**nov**ilunar	OED, AHD, W3
-nuc-	1665	Latin *nux, nucis*	nut	**nuc**iferous	OED, AHD
-nucle-	1840	Latin *nucleus*	core, nucleus	**nucle**iform, **nucle**oplast	OED, AHD, W3
-nud-	1857	Latin *nūdus*	bare, naked	**nud**iped	OED, AHD, W3
-nyct-	1857	Greek *νύξ, νύκτος*	night	**nyct**itropic, **nyct**ophonia	OED, AHD, W3
-nymph-	1776	Greek *νύμφη*	maiden; clitoris	**nymph**olepsy, **nymph**omania	OED, AHD, W3
-nystagm-	1899	Greek *νυσταγμός*	involuntary eye movement	**nystagm**iform, **nystagm**ography	OED, AHD
-o-	1727	Greek *ᾠόν*	egg	**o**oscopy	OED, AHD, W3
-ochl-	1594	Greek *ὄχλος*	crowd, mob	**ochl**ocracy	OED, AHD
-ochr-	1842	Greek *ὠχρός*	pale yellow	**ochr**opyra	OED, W3
-occipit-	1811	Latin *occiput, occipitis*	occiput	**occipit**ofrontal	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ocul-	1824	Latin *oculus*	eye	**ocul**igerous, **ocul**onasal	OED, AHD, W3
-odon-, -odont-	1809	Greek *ὀδούς, ὀδόντος*	tooth	mast**odon**, **odont**omancy, loph**odont**	OED, AHD, W3
-odyn-	1866	Greek *ὀδύνη*	pain	**odyn**ometer, scapul**odyn**ia	OED, AHD, W3
-oen-	1652	Greek *οἶνος*	wine	**oen**omancy	OED, AHD, W3
-oesophag- [var. -esophag-]	1868	Greek *οἰσοφάγος*	oesophagus	**oesophag**oscope	OED, AHD, W3
-ole-	c1240	Latin *oleum*	oil	**ole**iferous, **ole**ograph, petr**ole**um	OED, AHD, W3
-olig-	1542	Greek *ὀλίγος*	few, little	**olig**archy, **olig**uria	OED, AHD, W3
-om-	1706	Greek *ὠμος*	raw, unripe; cruel	**om**ophagia, **om**ophron	OED, W3
-om-	1854	Greek *ὠμος*	shoulder	**Om**ophore	OED, W3
-ombr-	1744	Greek *ὄμβρος*	rain	**ombr**ometer	OED, W3
-omm-, -ommat-	1878	Greek *ὤμμα, ὤμματος*	eye	**omm**ochrome, **ommat**ophore	OED, AHD, W3
-omphal-	1652	Greek *ὀμφαλός*	navel, umbilicus	**omphal**omancy	OED, AHD, W3
-on-	c1398	Greek *ὄνος*	ass, donkey	**on**ager	OED, AHD
-on-, -onom-, -onomat-, -onym-	1602	Greek *ὄνομα, ὀνόματος*	name	**on**omancy, **onom**atechny, **onomat**ology, patr**onym**	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-onc-	1857	Greek *ὄγκος*	tumor	**onc**ology	OED, AHD, W3
-onc- [var. -onch-]	1892	Greek *ὄγκος*	barb, hook	**onch**ocercal	OED, AHD, W3
-oneir- [var. -onir-]	1614	Greek *ὄνειρος*	dream	**oneir**ocracy	OED, AHD, W3
-ont-	1663	Greek *ὄντος*	being; organism	**ont**ology, **ont**ogeny	OED, AHD, W3
-onych-	1652	Greek *ὄνυξ, ὄνυχος*	nail	**onych**omancy, koil**onych**ia	OED, AHD, W3
-oophor-	1872	Greek *ᾠφόρον*	ovary	**oophor**ectomy	OED, AHD, W3
-op-, -ops-, -opt-, -optic-	1661	Greek *ὤψ, ὄφις, ὀπτός, ὀπτικός*	vision; examination	nyctal**op**y, **opt**ometrist, **optic**okinetic, bi**ops**y	OED, AHD, W3
-op-	1897	Greek *ὀπός*	juice	**op**otherapy	OED, AHD, W3
-oph-, -ophi-	1609	Greek *ὄφις*	serpent, snake	palae**oph**is, **ophi**omach	OED, AHD, W3
-ophthalm-	1730	Greek *ὀφθαλμός*	eyeball	**ophthalm**oscopy, micr**ophthalm**ia	OED, AHD, W3
-opi-	1868	Greek *ὄπιον*	opium	**opi**omania	OED, AHD, W3
-opisth-	1697	Greek *ὄπισθε*	dorsal, posterior	**opisth**odomos	OED, AHD, W3
-ops-	c1656	Greek *ὀψέ, ὄψιος*	late	**ops**imathy	OED, W3
-ops-	1854	Greek *ὄψον*	delicate food	**ops**ophagy	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-or- [var. -ore-]	1780	Greek *ὄρος, ὄρεος*	mountain	**or**ology	OED, AHD, W3
-or-	1803	Latin *ōs, ōris*	mouth	**or**ifacial, **or**onasal	OED, AHD, W3
-oram-	1823	Greek *ὅραμα*	sight, view	cosm**oram**a	OED, AHD
-orch-, -orchi-, -orchid-	1753	Greek *ὄρχις, ὄρχιος*	testicle	**orch**otomy, **orchi**ocele, **orchid**opexy, crypt**orchid**	OED, AHD
-orex-	1907	Greek *ὄρεξις*	desire, appetite	**orex**igenic, orth**orex**ia	OED, AHD, W3
-orn-, -ornith-	1652	Greek *ὄρνις, ὄρνιθος*	bird	**orn**iscopist, **ornith**ologer, din**ornith**ic	OED, AHD, W3
-orth-	c1454	Greek *ὀρθός*	straight; correct	**orth**odromic, **orth**odox	OED, AHD, W3
-oryct-	1753	Greek *ὀρυκτός*	fossil	**oryct**ography	OED, AHD, W3
-oryz-	1857	Latin *oryza*	rice	**oryz**ivorous	OED, W3
-osche-	1728	Greek *ὄσχεος*	scrotum	**osche**ocele	OED, W3
-osm-, -osphres-, -osphresi-	1842	Greek *ὀσμή, ὄσφρησις*	odor, smell	**osm**ometry, copr**osm**a, oxy**osphres**ia, **osphresi**ology	OED, AHD, W3
-oss-, -osse-	1721	Latin *os, ossis*	bone	**oss**ifragous	OED, AHD, W3
-ost-, -oste-	1612	Greek *ὀστέον*	bone	**oste**omancy, chondr**oste**an	OED, AHD, W3
-ostrac-	1839	Greek *ὄστρακον*	hard shell	**ostrac**ology	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ostre-	1840	Latin *ostrea*	oyster	**ostre**iculture, **ostre**ophagist	OED, W3
-ot-	1772	Greek *οὖς, ὠτός*	ear	**ot**orrhoea, macr**ot**ous	OED, AHD, W3
-ov-	1646	Latin *ōvum*	egg	**ov**iparous, **ov**ogenous	OED, AHD, W3
-ox-	1603	Greek *ὀξύς*	sharp	**ox**yrhynchus	OED, AHD, W3
-p-, -pod-	1555	Greek *πούς, ποδός*	foot	platy**p**us, **pod**ology, cheno**pod**	OED, AHD, W3
-pach-	1828	Greek *παχύς*	thick	**pach**yderm	OED, AHD, W3
-paed- [var. -ped-]	1647	Greek *παῖς, παιδός*	child; education	**paed**ocracy, hypno**paed**ia	OED, AHD, W3
-pag-	1848	Greek *πάγος*	fastened	pygo**pag**us	OED, W3
-pal-	1582	Greek *πάλιν*	again	**pal**ilogia	OED, AHD, W3
-palae- [var. -pale-]	1806	Greek *παλαιός*	ancient, primitive	**palae**ography	OED, AHD, W3
-palat-	1828	Latin *palātum*	palate	**palat**oglossus, apico**palat**al	OED, AHD, W3
-palm-	1646	Latin *palma*	palm; palm tree	**palm**ipedous, **palm**ivorous	OED, AHD, W3
-palud-	1857	Latin *palūs, palūdis*	marsh	**palud**icolous	OED, AHD, W3
-pan-, -pant-	1597	Greek *πᾶν, παντός*	all	**pan**orama, **pant**agamy, **pant**ometer, theo**pant**ism	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-papul-	1857	Latin *papula*	pimple	**papul**iferous, **papul**osquamous	OED, AHD, W3
-papyr-	1656	Greek *πάπυρος*	papyrus; paper	**papyr**iferous, **papyr**ographer, **papyr**ophobia	OED, AHD, W3
-par-, -per-	c1429	Latin *parere*	giving birth; producing	vivi**par**al, igni**par**ous, puer**per**al	OED, AHD, W3
-pariet-	1853	Latin *pariēs, parietis*	body wall	**pariet**osplanchnic, fronto**pariet**al	OED, AHD, W3
-parr-	c1545	Latin *parēns*	close relative	**parr**icide	OED, AHD, W3
-parthen-	c1834	Greek *παρθένος*	virgin	**parthen**olatry	OED, AHD, W3
-parv-	1857	Latin *parvus*	small	**parv**ifolious	OED, AHD, W3
-path-	c1586	Greek *πάθος*	feeling; disease; perceiving; suffering	**path**ology, **path**ography, myo**path**y, tele**path**y, psycho**path**	OED, AHD, W3
-patr-	c980	Latin *pater, patris*	father	**patr**iarch, **patr**onymic	OED, AHD, W3
-pauc-	1623	Latin *paucus*	few	**pauc**iloquy	OED, AHD, W3
-pectin-	1831	Latin *pecten, pectinis*	comb	**pectin**iform	OED, AHD, W3
-pector-	1824	Latin *pectus, pectoris*	breast, chest	**pector**iloquous	OED, AHD
-ped-	1572	Latin *pēs, pedis*	foot; step	**ped**icure, **ped**omancy, scuti**ped, ped**ometer	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ped-	1625	Greek *πέδον*	soil	**ped**ography	OED, AHD, W3
-pel-	1884	Greek *πηλός*	clay, mud	**pel**olithic	OED, AHD, W3
-pelag-	1882	Greek *πέλαγος*	sea	**pelag**osaur, bathy**pelag**ic	OED, AHD, W3
-pelv-	1754	Latin *pēlvis*	pelvis	**pelv**iferous	OED, AHD, W3
-pen-	1838	Latin *poena*	punishment	**pen**ology	OED, AHD
-pen-	1898	Greek *πενία*	deficiency, lack	leuco**pen**ic	OED, AHD, W3
-penn-	1603	Latin *penna*	feather; wing	**penn**igerous, **penn**ipotent, brevi**penn**ate	OED, AHD, W3
-peps-	1598	Greek *πέσσειν*	digesting	brady**peps**y	OED, AHD, W3
-per-	1875	Greek *πηρός*	crippled, deformed	**per**omelous	OED, AHD
-perd-, -pord-	1756	Greek *πέρδεσθαι*	breaking wind	lyco**perd**on, Ono**pord**on	OED, W3
-periss-	1583	Greek *περισσός*	superfluous	**periss**ology	OED, AHD
-peron-	1867	Greek *περόνη*	fibula	**Peron**ospora	OED, AHD, W3
-pet-	1687	Latin *petere*	seeking	centri**pet**al	OED, AHD, W3
-petal-	1788	Latin *petalum*	petal	**petal**iform, **petal**ocerous, gamo**petal**ous	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-petr-	1651	Greek *πέτρα*	rock, stone	**petr**icolous, **petr**ography	OED, AHD, W3
-pex-	1893	Greek *πηγνύναι*	fixing, joining	orchido**pex**y	OED, W3
-phac- [var. -phak-]	1843	Greek *φακός*	lens	**phac**olite	OED, AHD, W3
-phae- [var. -phe-]	1886	Greek *φαιός*	brownish, dusky	**phae**oplast	OED, W3
-phag-	1614	Greek *φάγειν*	eating	**phag**ocyte, sarco**phag**al	OED, AHD, W3
-phall-	c1693	Greek *φαλλός*	penis; man	**phall**algia, **phall**oplasty, ithy**phall**ian, **phall**ocracy	OED, AHD
-phan-, -phanc-, -phaner-, -phant-, -phantasm-, -phantasmat-, -phen- [var. -phaen-]	1579	Greek *φαίνειν, φανερός*	manifest, visible	pneumato**phan**y, hiero**phanc**y, **phaner**ogamous syco**phant**, **phantasm**agory, **phantasmat**ography, **phaen**ocarpous	OED, AHD, W3
-pharmac-	1541	Greek *φάρμακον*	drug, medicine	**pharmac**opole	OED, AHD, W3
-pharyng-	1730	Greek *φάρυγξ*	pharynx	**pharyng**otomy	OED, AHD, W3
-phell-	1802	Greek *φελλός*	cork	**phell**oplastic	OED, AHD, W3
-phenakist-	1834	Greek *φενακίζειν*	cheating, deceiving	**phenakist**oscope	OED, AHD
-pher-, -phor-	1606	Greek *φέρειν*	carrying	chrono**pher**, **phor**ometer, phos**phor**	OED, AHD, W3
-phil-	c1325	Greek *φίλειν*	loving; sexual attraction	**phil**osophy, biblio**phil**ous, geronto**phil**	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-phleb-	1684	Greek *φλέψ, φλεβός*	vein	**phleb**orrhagia, metro**phleb**itis	OED, AHD, W3
-phlog-	1881	Greek *φλόξ, φλογός*	inflammation	**phlog**ogenic	OED, AHD
-phlycten-	1858	Greek *φλύζειν*	blister, pustule	**phlycten**ophthalmy	OED, AHD
-phob-	1547	Greek *φόβειν*	fear	**phob**anthropy, hydro**phob**ia	OED, AHD, W3
-phoc-	1861	Greek *φώκη*	seal	**phoc**omelia	OED, AHD
-pholid-	1890	Greek *φολίς, φολιδός*	scale	**pholid**olite	OED, AHD, W3
-phon-	1701	Greek *φωνή*	sound, voice; pronouncing	**phon**ography, tele**phon**e, ortho**phon**y	OED, AHD, W3
-phot-	1772	Greek *φῶς, φωτός*	light	**phot**ophobia, holo**phot**e	OED, AHD, W3
-phras-, -phrase-, -phrast-	1604	Greek *φήμη, φάσις, φράζειν*	elocution, speech	brady**phras**ia, **phrase**ology, holo**phrast**ic	OED, AHD, W3
-phreat-	1920	Greek *φρέαρ, φρέατος*	spring, well	**phreat**ophyte	OED, AHD
-phren-	1810	Greek *φρήν*	mind; diaphragm	**phren**ology, schizo**phren**ic, **phren**ogram	OED, AHD, W3
-phthir-	1585	Greek *φθείρ*	louse	**phthir**ophagous	OED, AHD
-phthisi-	1842	Greek *φθίσις*	tuberculosis	**phthisi**ology	OED, AHD, W3
-phyc-	1867	Greek *φῦκος*	algae, seaweed	**phyc**ochrome	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-phyl-	1869	Greek *φῦλον*	tribe	**phyl**ogeny	OED, AHD, W3
-phylact-	1856	Greek *φυλάσσειν*	protection	**phylact**ocarp	OED, AHD
-phyll-	1669	Greek *φύλλον*	leaf	**phyll**omania, xantho**phyll**	OED, AHD, W3
-phys-	1706	Greek *φῦσα*	bladder	**phys**ophorous, **phys**ometra	OED, AHD, W3
-phys-, -physi-	1564	Greek *φύσις*	nature	psycho**phys**ic, **physi**ology	OED, AHD, W3
-phyt-	1643	Greek *φυτόν*	plant	**phyt**ognomy, litho**phyt**e,	OED, AHD, W3
-picr-	1813	Greek *πικρός*	bitter	**picr**olite	OED, AHD, W3
-pict-	1851	Latin *pingere*	painted	**pict**ograph	OED, AHD, W3
-piez-	1820	Greek *πιέζειν*	pressing, squeezing	**piez**ometer	OED, AHD, W3
-pil-	1698	Latin *pilus*	hair	**pil**iferous	OED, AHD, W3
-pin-	1895	Greek *πίνειν*	drinking	**pin**ocytic	OED, AHD
-pinac-	1887	Greek *πίναξ, πίνακος*	board, plank	**pinac**ocyte	OED, W3
-pinn-	1656	Latin *pinna*	feather, wing	**pinn**igerous	OED, AHD, W3
-pis-	1708	Greek *πίσός*	pea	**pis**olite	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-pisc-	1807	Latin *piscis*	fish	**pisc**iculture	OED, AHD, W3
-pithec-	1572	Greek *πίθηκος*	ape, monkey	**pithec**anthropic, cerco**pithec**us	OED, AHD, W3
-plac-	1858	Greek *πλάξ, πλακός*	flat plate, tablet	**plac**odont	OED, AHD, W3
-plagi-	1816	Greek *πλάγιος*	oblique	**plagi**ocephalic	OED, AHD, W3
-plan-	1672	Latin *plānus*	flat, plane	**plan**ifolious, **plan**ometer	OED, AHD, W3
-plan-	1845	Greek *πλάνος*	straying	**plan**uria, meno**plan**ia	OED, AHD, W3
-plant-	1671	Latin *planta*	plant; sole of the foot	**plant**igerous, **plant**igrade	OED, AHD
-plas-, -plasm-, -plast-	1801	Greek *πλάσμα, πλάστός*	cell formation, tissue formation; plastic surgery	neo**plas**ia, **plasm**ology, cero**plast**ic	OED, AHD, W3
-plat-	1799	Greek *πλατύς*	flat	**plat**ystomous	OED, AHD, W3
-ple-, -plei-, -pli-	1814	Greek *πλεῖον*	excessive, supernumerary	**ple**onexia, **plei**omastia, **pli**osaurus	OED, AHD, W3
-plect-	1835	Greek *πλεκτός*	twisted	**plect**ognathic	OED, AHD, W3
-pleg-	1839	Greek *πλησσειν*	paralysis, stroke	**pleg**ometer, cyclo**pleg**ia	OED, AHD, W3
-plen-	c1475	Latin *plēnus*	full	**plen**ilune	OED, AHD
-plesi-	1821	Greek *πλησιός*	close, near	**plesi**osaurus	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-pleur-	1706	Greek *πλευρά*	pleura; rib, side	**pleur**ocele, **pleur**odynia	OED, AHD, W3
-plum-	1656	Latin *plūma*	feather	**plum**igerous	OED, AHD
-plumb-	1796	Latin *plumbum*	lead	**plumb**iferous	OED, AHD, W3
-plut-	c1643	Greek *πλοῦτος*	wealth	**plut**archy	OED, AHD, W3
-pluvi-	1755	Latin *pluvia*	rain	**pluvi**ometer	OED, AHD, W3
-pne- [var. -pnoe-], -pneum-, -pneumon-, -pneumat-, -pneust-	1543	Greek *πνοή, πνεῦμα, πνεύματος*	gas; lung; breathing; spirit	**pneumat**olysis, **pneum**ogastric, **pneumon**ocele, **pne**ograph, ortho**pnoe**a, entero**pneust**al, **pneumat**ophobia	OED, AHD, W3
-poe- [var. -poie-], -poes- [var. -poies-], -poet- [var. -poiet-]	1659	Greek *ποιία, ποίησις, ποιητικός*	formation, production	etho**poe**ia, haemato**poies**is, galacto**poet**ic	OED, AHD, W3
-poecil- [var. -poikil-]	1877	Greek *ποικίλος*	variegated, various	**poecil**onymy, **poikil**othermal	OED, AHD, W3
-pogon-	1786	Greek *πώγων*	beard	**pogon**ology, Ophio**pogon**	OED, W3
-pol-, -polit-	c1387	Greek *πόλις*	city	necro**pol**is, metro**polit**an	OED, AHD, W3
-polem-	1579	Greek *πόλεμος*	battle, war	**polem**arch	OED, AHD
-poli-	1878	Greek *πολιός*	gray	**poli**omyelitis	OED, AHD, W3
-pollin-	1803	Latin *pollen, pollinis*	pollen	**pollin**iferous	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-pom-	1656	Latin *pōmum*	apple	**pom**iferous	OED, AHD, W3
-pomp-	c1901	Greek *πέμπειν*	sending away	hypno**pomp**ic	OED, AHD
-pon-	1612	Greek *πένεσθαι*	labor, toil	geo**pon**ic	OED, AHD
-por-	1871	Greek *πόρος*	opening, orifice	**por**oplastic, blasto**por**e	OED, AHD, W3
-porn-	1842	Greek *πόρμη*	prostitute, whore	**porn**ography, philo**porn**ist	OED, AHD
-pos-	1754	Greek *πόσον*	quantity	**pos**ologic	OED, AHD
-posth-, -posthi-	1846	Greek *πόσθη*	foreskin	**posth**etomy, **posthi**oplasty	OED, W3
-pot-	1623	Greek *πότος*	drink	**pot**ometer, hydro**pot**ic	OED, AHD
-potam-	c1340	Greek *ποταμός*	river	**potam**ography, hippo**potam**us	OED, AHD, W3
-potenc-, -potent-, -potenti-	c1560	Latin *potēns, potentis*	powerful	lingui**potenc**e, auri**potent**, **potenti**ometer	OED, AHD, W3
-pract-, -prax-, -praxe-	1878	Greek *πράσσειν*	movement	chiro**pract**ic, echo**prax**ia, **praxe**ology	OED, AHD, W3
-presby-	1746	Greek *πρέσβυς*	old age	**presby**ope	OED, AHD, W3
-prion-	1854	Greek *πρίων*	saw	**prion**odont	OED, W3
-proct-	1772	Greek *πρωκτός*	anus, rectum	**proct**algia, **proct**oscope	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-prol-	1654	Latin *prōlēs*	offspring	**prol**iferous	OED, AHD, W3
-prosop-	1577	Greek *πρόσωπον*	person; face	**prosop**ography, **prosop**ology	OED, AHD, W3
-prosth-	1917	Greek *προστιθέναι*	addition	**prosth**odontist	OED, AHD
-prot-	1610	Greek *πρῶτος*	original, primary	**prot**onym, **prot**opathy	OED, AHD, W3
-psamm-	1869	Greek *ψάμμος*	sand	**psamm**ophilous	OED, W3
-pseud-	1601	Greek *ψευδής*	erroneous, false	**pseud**andry, **pseud**odox	OED, AHD, W3
-psil-	1808	Greek *ψιλός*	bare; shallow	**psil**odermatous, **psil**osophy	OED, AHD, W3
-psittac-	1923	Greek *ψιττακός*	parrot	**psittac**osaurus	OED, AHD
-psor-	1585	Greek *ψώρα*	itch	**psor**ophthalmia	OED, AHD, W3
-psych-	1572	Greek *ψύχη*	soul, spirit; mind	**psych**ogony, **psych**algia, **psych**ometer, omphalo**psych**ic	OED, AHD, W3
-psychr-	1724	Greek *ψυχρόν*	cold	**psychr**ophobia	OED, AHD, W3
-pter-, -pterid-, -pteryg-, -ptil-	1770	Greek *πτερόν, πτερίς, πτίλον*	fin, wing; feather	brachy**pter**ous, **pter**ocarpus, **pteryg**oblast, **ptil**opedic, coleo**ptil**e	OED, AHD, W3
-ptoch-	1774	Greek *πτωχός*	beggar	**ptoch**ocracy	OED, W3
-ptos-	1807	Greek *πίπτειν*	drooping, falling	blepharo**ptos**is	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-ptyal-, -ptys-	1646	Greek *πτύαλον, πτύσις*	saliva, spittle	**ptyal**alogue, haemo**ptys**is	OED, AHD, W3
-ptych-	1873	Greek *πτυχός*	fold, layer	**ptych**odont	OED, W3
-puer-	c1429	Latin *puer*	child	**puer**peral	OED, AHD
-pulm-, -pulmon-	1814	Latin *pulmō, pulmōnis*	lung	**pulm**ometer, **pulmon**iferous, **pulmon**ologist	OED, AHD, W3
-punct-	1684	Latin *pungere*	piercing, stinging	**punct**iform, acu**punct**ure	OED, AHD
-pupill-	1864	Latin *pūpilla*	pupil of the eye	**pupill**ometer	OED, AHD, W3
-purpur-	1858	Latin *purpura*	purple	**purpur**iferous	OED, AHD, W3
-py-	1772	Greek *πύον*	pus, suppuration	**py**uria	OED, AHD, W3
-pycn- [var. -pykn-]	1838	Greek *πυκνός*	compact, dense	**pycn**aster	OED, AHD, W3
-pyel-	1844	Greek *πύελος*	pelvis	**pyel**oplasty	OED, AHD, W3
-pyg-	1646	Greek *πυγή*	buttock, rump	**pyg**opodous, calli**pyg**ian	OED, AHD, W3
-pyl-, -pylor-	1821	Greek *πύλη, πυλωρός*	opening, orifice; pylorus	**pyl**ephlebitis, micro**pyl**e, **pylor**ectomy	OED, AHD, W3
-pyr- [var. -pir-]	1717	Latin *pirum*	pear	**pyr**iform	OED, AHD
-pyr-, -pyret-	c1393	Greek *πῦρ, πυρετός, πυρρός*	fire, heat; fever	**pyr**omancy, ochro**pyr**a, **pyret**ology, alexi**pyret**ic	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-pyren-	1857	Greek *πύρην*	fruit stone	**pyren**omycetous	OED, AHD, W3
-rach- [var. -rhach-], -rachi- [var. -rhachi-]	1772	Greek *ῥάχις*	backbone, spine	**rach**itome, **rachi**algia	OED, AHD, W3
-radi-	1880	Latin *radius*	radiation, ray	**radi**ometry	OED, AHD, W3
-ran-	1821	Latin *rāna*	frog	**ran**ivorous	OED, W3
-rect-	c1560	Latin *rēctus*	right, straight; rectum	**rect**angular, **rect**ocele	OED, AHD, W3
-reg-	1548	Latin *rēx, rēgis*	king, sovereign	**reg**icide	OED, AHD, W3
-rem-	1826	Latin *rēmus*	oar	**rem**ipede	OED, W3
-ren-	1745	Latin *rēnēs*	kidney	**ren**iform, **ren**ography	OED, AHD, W3
-resin-	1675	Latin *rēsīna*	resin	**resin**iferous	OED, AHD, W3
-retin-	1855	Latin *rētina*	retina	**retin**oscopy, cilio**retin**al	OED, AHD, W3
-rhabd-	1646	Greek *ῥάβδος*	rod, stick	**rhabd**omancy	OED, AHD, W3
-rhamph-	1870	Greek *ῥάμφος*	beak	**rhamph**otheca	OED, W3
-rhe-, -rrhe- [var. -rrhoe-]	1547	Greek *ῥέον*	discharge, flow	**rhe**otaxis, gono**rrhoe**a	OED, AHD, W3
-rhin- [var. -rrhin-]	c1300	Greek *ῥίς, ῥινός*	nose	**rhin**oceros, lepto**rrhin**ian	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-rhip-, -rhipid-	1855	Greek *ῥιπίς, ῥιπίδος*	fan	**rhip**ipterous, **rhipid**oglossate	OED, W3
-rhiz- [var. -rrhiz-]	1832	Greek *ῥίζα*	root	**rhiz**anthous, myco**rrhiz**a	OED, AHD, W3
-rhod- [var. -rrhod-]	1601	Greek *ῥόδον*	rose	**rhod**odendron, cyno**rrhod**on	OED, AHD, W3
-rhomb-	1816	Greek *ῥόμβος*	lozenge	**rhomb**iferous	OED, AHD, W3
-rhynch-	1603	Greek *ρύγχος*	snout	**rhynch**osaurian, oxy**rhynch**us	OED, AHD, W3
-rhopal-	1882	Greek *ῥόπαλον*	club	**rhopal**ocerous	OED, W3
-rhyp-, -rhypar-	1656	Greek *ῥύπος, ῥυπαρός*	dirt, filth	**rhyp**ophagy, **rhypar**ographer	OED, W3
-rip-	1859	Latin *rīpa*	river bank	**rip**icolous	OED, AHD
-rostr-	1801	Latin *rostrum*	beak	**rostr**iform, **rostr**olateral, denti**rostr**al	OED, AHD, W3
-rrhag- [var. -rrag-], -rrhex-	1541	Greek *ῥηγνύναι*	breaking, bursting	haemo**rrhag**ia, phlebo**rrhex**is	OED, AHD, W3
-rrhaph-	1739	Greek *ῥάπτειν*	stich, suture	gastro**rrhaph**y	OED, W3
-rumen-	1882	Latin *rūmen*	gullet, throat	**rumen**otomy	OED, AHD, W3
-rup-	1858	Latin *rūpēs*	rock	**rup**icolous	OED, AHD
-sacc-	1836	Latin *saccus*	sac	**sacc**iform	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-sacchar-	1757	Greek *σάκχαρον*	sugar	**sacchar**iferous, **sacchar**ometer	OED, AHD, W3
-sacr-	1656	Latin *sacer*	holy, sacred	**sacr**iferous	OED, AHD, W3
-sal-, -salin-	1799	Latin *sāl, salis, salīnus*	salt	**sal**iferous, **salin**iform, **salin**ometer	OED, AHD, W3
-salping-	1884	Greek *σάλπιγξ, σάλπιγγος*	tube	**salping**ectomy	OED, AHD, W3
-sangu-, -sanguin-	1682	Latin *sanguīs, sanguinis*	blood	**sangu**iferous, **sanguin**ivorous	OED, AHD, W3
-sapr-	1819	Greek *σαπρός*	putrid, rotten	**sapr**ophagous	OED, AHD, W3
-sarc-	1614	Greek *σάρξ, σαρκός*	flesh	**sarc**ophage, psycho**sarc**ous	OED, AHD, W3
-saur-	1821	Greek *σαῦρος*	lizard	**saur**ognathous, ichthyo**saur**	OED, AHD, W3
-sax-	c1440	Latin *saxum*	rock	**sax**ifrage	OED, AHD, W3
-scap-	1796	Latin *scāpus*	stalk, stem	**scap**igerous	OED, AHD, W3
-scaph-	1854	Greek *σκάφη*	boat	**scaph**ocerite, bathy**scaph**e	OED, AHD, W3
-scapul-	1840	Latin *scapula*	shoulder	**scapul**algia	OED, AHD, W3
-scat-	1569	Greek *σκώρ, σκατός*	excrement	**scat**omancy	OED, AHD
-scel-, -scelid-	1855	Greek *σκέλός*	leg	**scel**algia, **scelid**osaur	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-schis-, -schist-, -schiz-	1823	Greek *σχίζειν*	division, split	trich**oschis**is, **schist**oscope, **schiz**anthus	OED, AHD, W3
-sci- [var. -ski-]	1623	Greek *σκία*	shadow	**sci**omancy, **ski**amachy	OED, AHD, W3
-scler-	1693	Greek *σκληρός*	hard	**scler**anth, **scler**ophthalmia	OED, AHD, W3
-scolec-	1661	Greek *σκώληξ*	worm	**scolec**iform, **scolec**ology	OED, AHD, W3
-scop-	c1050	Greek *σκοπειν*	beholding, examining	**scop**ophilia, horo**scop**e	OED, AHD, W3
-scop-	1794	Latin *scōpa*	broom, brush	**scop**iform	OED, AHD, W3
-scot- [var. -skot-]	1664	Greek *σκότος*	darkness	**scot**oscope	OED, AHD
-scut-	1656	Latin *scūtum*	shield	**scut**iferous	OED, AHD, W3
-scyph-	1855	Greek *σκύφος*	cup	**scyph**istoma, **scyph**omancy	OED, AHD, W3
-seb-	1855	Latin *sēbum*	fat, grease	**seb**iparous, **seb**orrhoea	OED, AHD, W3
-seism-	1841	Greek *σεισμός*	earthquake	**seism**ometer	OED, AHD, W3
-selen-	c1650	Greek *σελήνη*	moon	**selen**igenous, **selen**ography, geo**selen**ic	OED, AHD, W3
-sem-, -semasi-, -semat-, -semi-	1706	Greek *σῆμα, σημασία, σηματός, σημεῖον*	sign	**sem**aphoric, **semas**iology, **semat**ography, **semi**ological	OED, AHD, W3
-semn-	1824	Greek *σεμνός*	venerable	**Semn**opithecus	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-sept-, -septic-	1866	Greek *σηπτός, σηπτικός*	putrefaction	**sept**ogenic, **septic**aemia	OED, AHD
-seric-	1831	Latin *sēricum*	silk	**seric**iculture, holo**seric**eous	OED, AHD
-serpent-	1730	Latin *serpēns, serpentis*	serpent, snake	**serpent**igerous	OED, AHD, W3
-serr-	1822	Latin *serra*	saw	**serr**iform	OED, AHD, W3
-set-	1656	Latin *sēta*	bristle	**set**igerous	OED, AHD, W3
-sial-	1846	Greek *σίαλον*	saliva	**sial**orrhoea	OED, AHD, W3
-sider-	1823	Greek *σίδηρος*	iron	**sider**omancy	OED, AHD, W3
-sider-	1846	Latin *sīdus, sīderis*	star	**sider**olith	OED, AHD, W3
-sigill-	1879	Latin *sigillum*	seal	**sigill**ography	OED, AHD
-silic-	1796	Latin *silex, silicis*	flint, silica	**silic**iferous	OED, AHD, W3
-silv- [var. -sylv-]	1880	Latin *silva*	forest, wood; tree	**sylv**iculture, **silv**icide	OED, AHD
-sinistr-	1803	Latin *sinister*	on the left	**sinistr**ocerebral	OED, AHD, W3
-siphon-	1835	Greek *σίφων*	pipe, tube	**siphon**iferous, **siphon**oglyph	OED, AHD, W3
-sit- [var. -siti-]	1849	Greek *σιτίον*	food	**siti**ology	OED, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-soci-	1843	Latin *socius*	society	**soci**ologist	OED, AHD, W3
-solen-	1840	Greek *σωλήν*	channel, pipe	**solen**odont	OED, AHD, W3
-sol-	1658	Latin *sōl, solis*	sun	**sol**ifuge, luni**sol**ar	OED, AHD
-som-, -somat-	1607	Greek *σῶμα, σώματος*	body	**som**andric, meso**som**a, **somat**algia, psycho**somat**ic	OED, AHD, W3
-somn-	1602	Latin *somnus*	sleep	**somn**iferous, **somn**opathy	OED, AHD, W3
-son-	1656	Latin *sonāre*	sound	**son**iferous, **son**ograph, magni**son**ant	OED, AHD, W3
-soph-, -sophi-	c1325	Greek *σοφός*	wisdom	philo**soph**y, **sophi**ology	OED, AHD, W3
-sopor-	1590	Latin *sopor*	excessive sleep	**sopor**iferous	OED, AHD
-soteri-	1768	Greek *σωτήριον*	salvation	**soteri**alogy	OED, AHD
-span-	1845	Greek *σπάνιος*	scarce	**span**aemia	OED, W3
-spele-	1895	Greek *σπήλαιον*	cave	**spele**ology	OED, AHD
-sperm-, -spermat-	1682	Greek *σπέρμα, σπέρματος*	seed, semen	**sperm**oderm, gymno**sperm,** **spermat**ophytic, angio**spermat**ous	OED, AHD, W3
-sphaer- [var. -spher-]	1658	Greek *σφαῖρα*	globe	**sphaer**omachy, aero**spher**e	OED, AHD, W3
-sphen-	1771	Greek *σφήν*	wedge	**Sphen**opteris, zygo**sphen**e	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-sphygm-	1834	Greek *σφυγμός*	pulse	**sphygm**ometer	OED, AHD, W3
-spic-	1656	Latin *spīca*	spike	**spic**iferous	OED, AHD
-spin-	1656	Latin *spīna*	backbone, spine	**spin**igenous, cerebro**spin**al	OED, AHD, W3
-spir-	1846	Latin *spīra*	coil, twist	**spir**iferous, **spir**ochaete, concho**spir**al	OED, AHD, W3
-splanchn-	1706	Greek *σπλάγχνα*	entrails, viscera	**splanchn**ology, parieto**splanchn**ic	OED, AHD, W3
-splen-	1799	Greek *σπλήν*	spleen	**splen**ectomy, **splen**ocele	OED, AHD, W3
-spondyl-	1859	Greek *σφόνδυλος*	vertebra	**spondyl**odynia, lepos**pondyl**ous	OED, AHD, W3
-spong-, -spongi-	1805	Latin *spongia*	sponge	**spong**iform, **spongi**oblast	OED, AHD, W3
-spor-	1836	Greek *σπορά*	spore	**spor**iferous, **spor**ocyte, acro**spor**ous	OED, AHD, W3
-squam-	1656	Latin *squāma*	scale	**squam**igerous, papulo**squam**ous	OED, AHD, W3
-stann-	1823	Latin *stannum*	tin	**stann**iferous, **stann**olite	OED, AHD, W3
-staphyl-	1835	Greek *σταφυλή*	palate; uvula	**staphyl**orrhaphy, **staphyl**otomy	OED, AHD, W3
-stas-, -stat-	1747	Greek *στάσις, στατός*	standing	**stas**imetric, copro**stas**is, **stat**oblast, helio**stat**	OED, AHD, W3
-staur-	1600	Greek *σταυρός*	cross	**staur**olatry	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-stax-	1906	Greek *στάξις*	dripping, oozing	gastro**stax**is	OED, W3
-steat-	1693	Greek *στέαρ, στέατος*	fat, tallow	**steat**ocele	OED, AHD, W3
-steg-, -stegan-	1562	Greek *στέγος, στεγανός*	covering	**Steg**odon, uro**steg**e, **stegan**ographer	OED, AHD, W3
-sten-	1602	Greek *στενός*	narrow	**sten**ography	OED, AHD, W3
-stephan-	1624	Greek *στέφανος*	crown	**stephan**ophore	OED, AHD, W3
-sterc-, -stercor-	1845	Latin *stercus*	dung, excrement	**sterc**ovorous, **stercor**icolous	OED, AHD
-stere-	1570	Greek *στερέος*	solid	**stere**ometry	OED, AHD, W3
-stern-	1652	Greek *στέρνον*	breastbone	**stern**omancy, omo**stern**al	OED, AHD, W3
-steth-	1820	Greek *στῆθος*	chest	**steth**oscope	OED, AHD, W3
-sthen-	1829	Greek *στένος*	strength	amyo**sthen**ic	OED, AHD
-stich-	c1693	Greek *στίχος*	line, row	**stich**omancy, pachy**stich**ous	OED, AHD, W3
-stom-, -stomat-	1823	Greek *στόμα, στόματος*	mouth	**stom**ochordal, entero**stom**y, **stomat**oplasty, micro**stomat**ous	OED, AHD, W3
-strat-	1805	Latin *strātum*	layer	**strat**iform, **strat**osphere, alto**strat**us	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-strept-, -strob-, -stroph-	1836	Greek *στέφειν*	twisted	**strept**ococcal, **strob**oscopic, **stroph**anthus, geo**stroph**ic	OED, AHD, W3
-styl-	1866	Greek *στῦλος*	column, pillar	**styl**olite, pygo**styl**e	OED, AHD, W3
-succin-	1896	Latin *succinum*	amber	**succin**iferous	OED, AHD, W3
-sudor-	1597	Latin *sūdor*	sweat	**sudor**iferous	OED, AHD
-syc-	1579	Greek *σῦκον*	fig	**syc**ophant	OED, AHD
-syring-	1753	Greek *σῦριγξ, συριγγος*	fistula, pipe	**syring**otomy	OED, AHD, W3
-tach-	1641	Greek *ταχύς*	fast, swift	**tach**ometer, **tach**ygraphy	OED, AHD, W3
-taen- [var. -ten-], -taeni-	1857	Greek *ταινία*	band, ribbon; tapeworm	**taeni**osomous, **taen**ifuge	OED, AHD, W3
-tal-	1887	Latin *tālus*	ankle	**tal**otibial	OED, AHD, W3
-talp-	1656	Latin *talpa*	mole	**talp**icide	OED, W3
-tan-	1860	Greek *τανύειν*	stretching	**tan**ystomous	OED, W3
-taph-	1603	Greek *τάφος*	tomb	**taph**onomy, ceno**taph**	OED, AHD
-tars-	1847	Greek *ταρσός*	tarsus of the foot; tarsus of the eyelid	**tars**ectomy, tibio**tars**al, **tars**orrhaphy	OED, AHD, W3
-taur-	1646	Greek *ταῦρος*	bull	**taur**icornous, **taur**omachy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-taut-	1579	Greek *ταὐτο*	identical	**taut**ology	OED, AHD, W3
-tax-	1813	Greek *τάξις*	arrangement	**tax**idermy, **tax**onomy, pleio**tax**y	OED, AHD, W3
-techn-	1579	Greek *τέχνη*	art, craft	**techn**ology, pyro**techn**y	OED, AHD, W3
-tecn-	c1677	Greek *τέκνον*	child	**tecn**ogonia	OED, W3
-tel-, -tele-, -teleut-	1728	Greek *τέλος, τέλεος, τελευτή*	completion, end	**tel**odendron, **tele**ology, **teleut**ospore	OED, AHD, W3
-tel-	1794	Greek *τῆλε*	distant	**tel**egraph	OED, AHD, W3
-tellur-	1882	Latin *tellūs, tellūris*	earth	**tellur**ometer, cosmo**tellur**ian	OED, AHD, W3
-ten-, -tenont-	1842	Greek *τένων, τένοντος*	tendon	**ten**otomy, **tenont**ography	OED, AHD, W3
-tenu-	1657	Latin *tenuis*	thin, slender	**tenu**ifolious	OED, AHD
-tephr-	1652	Greek *τεφρός*	ash	**tephr**omancy	OED, W3
-terat-	1663	Greek *τέρας, τέρατος*	marvel, prodigy; monster	**terat**oscopy, **terat**ogen	OED, AHD, W3
-terps-	1711	Greek *τέρπειν*	delight	**terps**ichorean	OED, AHD
-tetan-	1860	Greek *τέτανος*	muscular spasm	**tetan**igenous, **tetan**omotor	OED, AHD, W3
-thalam-	1857	Greek *θάλαμος*	chamber, receptacle	**thalam**ifloral, **thalam**ocele, pleio**thalam**ous	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-thalass-, -thalassi-, -thalatt-	1652	Greek *θάλασσα, θαλάσσιος, θάλαττα*	sea	**thalass**ometrician, **thalassi**ophytous, **thalatt**ology	OED, AHD, W3
-thall-	1846	Greek *θάλλειν*	young shoot	**thall**iform, **thall**ophyte	OED, AHD, W3
-thanat-	1816	Greek *θάνατος*	death	**thanat**ology, **thanat**opsis	OED, AHD, W3
-thaum-, -thaumat-	1632	Greek *θαῦμα, θαύματος*	miracle, wonder	**thaum**atrope, **thaumat**ography	OED, AHD
-the-	1362	Greek *θεός*	God	**the**ology, hylo**the**ism	OED, AHD, W3
-thec-	1826	Greek *θήκη*	sheath, covering; container; repository	podo**thec**a, **thec**igerous, nema**thec**ium, biblio**thec**a	OED, AHD, W3
-thel-	1780	Greek *θῆλυς*	female	**thel**ytokous	OED, W3
-thel-	1860	Greek *θηλή*	nipple, teat	**thel**ephoreous	OED, W3
-ther-, -theri-	1620	Greek *θήρ, θηρίον*	wild beast	**ther**osaur, philo**ther**ian, **theri**omancy	OED, AHD, W3
-therap-	1853	Greek *θεραπεύειν*	curing, healing	psycho**therap**y	OED, AHD, W3
-therm-	1533	Greek *θερμός*	heat	**therm**ometer, eury**therm**al	OED, AHD, W3
-thi-	1894	Greek *θεῖον*	sulphur	**thi**ogenic	OED, AHD, W3
-thigm-, -thix-	1900	Greek *θίγμα, θίξις*	touching	**thigm**otaxis, **thix**otropy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-thorac-	1826	Greek *θώραξ, θωρακός*	chest, thorax	**thorac**ipodous, **thorac**odynia	OED, AHD, W3
-threps-, -troph-	1819	Greek *τρέφειν*	nourishment, nutrition	**threps**ology, **troph**ogeny, histo**troph**ic	OED, AHD, W3
-thromb-	1844	Greek *θρόμβος*	blood clot	**thromb**olite	OED, AHD, W3
-thym-	1857	Greek *θυμός*	soul, spirit	**thym**opathy, schizo**thym**ia	OED, AHD, W3
-thyr-, -thyre-	1693	Greek *θυρεός*	thyroid cartilage; thyroid gland	**thyr**otomy, **thyre**ocele	OED, AHD, W3
-thysan-	1826	Greek *θύσανος*	fringe, tassel	**thysan**uran	OED, AHD, W3
-tib-, -tibi-	1803	Latin *tībia*	shinbone	talo**tib**ial, **tibi**otarsal	OED, AHD, W3
-toc-, -tok-	1828	Greek *τόκος*	childbirth, delivery	**toc**ology, thely**tok**ous	OED, AHD, W3
-tom-	c1400	Greek *τέμνειν*	cutting	**tom**iparous, **tom**ography, phlebo**tom**y	OED, AHD, W3
-ton-	1725	Greek *τόνος*	tone; tension	**ton**ometer, somato**ton**ia	OED, AHD, W3
-top-	1549	Greek *τόπος*	location, place	**top**ography, caco**top**ia	OED, AHD, W3
-tox-	1794	Greek *τόξον*	archery	**tox**ophilite	OED, W3
-tox-, -toxic-	1857	Latin *toxicum*	poison	**tox**iphobia, auto**tox**ic, **toxic**aemia	OED, AHD, W3
-trach-	1848	Greek *τραχύς*	harsh, rough	**trach**yphonia	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-trache-	1726	Greek *τραχεῖα*	trachea	**trache**otomy	OED, AHD, W3
-trachel-	1840	Greek *τράχηλος*	neck	**trachel**oplasty	OED, W3
-traum-, -traumat-	1854	Greek *τραῦμα, τραύματος*	injury, wound	**traum**atropic, **traumat**opyra	OED, AHD, W3
-trib-, -trips-	1774	Greek *τρίβειν*	rubbing	**trib**ometer, sterno**trib**e, cephalo**trips**y	OED, AHD, W3
-trich-	1816	Greek *θρίξ, τριχός*	hair	**trich**opterous, leio**trich**y	OED, AHD, W3
-trit-	1830	Latin *terere*	crushing	litho**trit**y	OED, AHD
-troch-	1875	Greek *τροχός*	wheel	**troch**ophore, meso**troch**a	OED, AHD, W3
-trogl-	1555	Greek *τρώγλη*	cave	**trogl**odyte	OED, AHD, W3
-trop-	c1380	Greek *τρέπειν*	reversing, turning	**trop**ologic, geo**trop**ic	OED, AHD, W3
-tryp-, -trypan-	1843	Greek *τρῦπα, τρύπανον*	auger, borer; hole	**Trypan**osoma, **tryp**ograph	OED, AHD, W3
-tub-, -tubul-	1745	Latin *tubus, tubulus*	tube	**tub**iform, **tubul**iflorous	OED, AHD, W3
-turr-	1656	Latin *turris*	tower	**turr**iferous	OED, AHD
-tyl-	1886	Greek *τύλος, τύλη*	knob; pad	**tyl**ostyle, **tyl**opodous	OED, W3
-typ-	1552	Greek *τύπος*	model; printing	**typ**ocosmy, proto**typ**e, **typ**onym	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-typh-	1693	Greek *τῦφος*	stupor; typhoid fever	**typh**omania, **typh**ogenic, pleuro**typh**oid	OED, AHD, W3
-typhl-	1857	Greek *τυφλός*	blind	**typhl**ology	OED, W3
-tyr-	1652	Greek *τυρός*	cheese	**tyr**omancy	OED, AHD, W3
-tyrann-	1650	Greek *τύραννος*	absolute ruler, dictator	**tyrann**icide, **tyrann**ophobia	OED, AHD
-ul-	1857	Greek *οὖλος*	curly	**ul**otrichous	OED, W3
-umbilic-	1867	Latin *umbilīcus*	navel	**umbilic**iform	OED, AHD
-unc-	1733	Latin *uncus*	hook	**unc**iform	OED, AHD
-ungu-	1726	Latin *unguis*	claw, nail	**ungu**iferous	OED, AHD, W3
-ur-	1646	Greek *οὖρον*	urine	**ur**oscopy, plan**ur**ia, **uric**aemia	OED, AHD, W3
-ur-	1681	Greek *οὐρά*	tail	**ur**opygium, brachy**ur**ous	OED, AHD, W3
-uran-	1584	Greek *οὐρανός*	heaven, sky; palate	**uran**oscope, **uran**oplasty	OED, AHD, W3
-urb-	1954	Latin *urbs, urbis*	city	**urb**iculture	OED, AHD
-urs-	c1793	Latin *ursus*	bear	**urs**iform	OED, AHD
-uter-	1822	Latin *uterus*	womb	**uter**otomy	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-utricul-	1910	Latin *utriculus*	small sac	**utricul**oplasty	OED, AHD, W3
-uxor-	1854	Latin *uxor, uxōris*	wife	**uxor**icide	OED, AHD
-vag-	1877	Latin *vagus*	wandering; vagus nerve	soli**vag**ous, **vag**otomy	OED, AHD, W3
-valv-, -valvul-	1819	Latin *valva, valvula*	valve	**valv**iform, **valvul**oplasty	OED, AHD, W3
-var-, -vari-	1662	Latin *varius*	diverse; variation	**var**iform, **vari**ometer	OED, AHD, W3
-varic-	1736	Latin *varix*	swollen vein	**varic**ocele	OED, AHD, W3
-vas-, -vascul-	1656	Latin *vās, vāsculum*	channel, duct; blood vessel	**vas**iferous, **vascul**iform, cardio**vascul**ar	OED, AHD, W3
-ven-	1817	Latin *vēna*	vein	**ven**igenous, **ven**ostasis	OED, AHD, W3
-ventr-, -ventricul-	1584	Latin *venter, ventris, ventriculus*	belly, stomach; ventricule of the brain	**ventr**iloquy, **ventr**oscopy, **ventricul**ography	OED, AHD, W3
-verm-	1646	Latin *vermis*	worm	**verm**iparous	OED, AHD, W3
-vesic-, -vesicul-	1835	Latin *vēsīca*	bladder	**vesic**ocervical, **vesicul**ospinal	OED, AHD, W3
-vexill-	1959	Latin *vexillum*	flag	**vexill**ology	OED, AHD
-vibr-	1875	Latin *vibrāre*	vibration	**vibr**oscope	OED, AHD, W3
-vide-	1963	Latin *vidēre*	view	**vide**ogram	OED, AHD

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-vin-	1832	Latin *vīnum*	wine	**vin**iferous	OED, AHD
-vir-	1587	Latin *vir*	husband, man	**vir**ipotent, dei**vir**ile	OED, AHD
-viscer-	1883	Latin *vīscera*	entrails	**viscer**optosis	OED, AHD, W3
-visc-	1883	Latin *viscum*	slime	**visc**ometer	OED, AHD, W3
-vit-	1865	Latin *vītis*	vine	**vit**iculture	OED, AHD, W3
-vitell-	1819	Latin *vitellus*	yolk	**vitell**iferous, **vitell**ophage	OED, AHD, W3
-vitr-	1796	Latin *vitrum*	glass	**vitr**iform	OED, AHD, W3
-viv-	1646	Latin *vīvus*	alive	**viv**iparous	OED, AHD, W3
-voc-	c1611	Latin *vōx, vōcis*	voice	**voc**iferous	OED, AHD
-vom-	1603	Latin *vomere*	vomiting	igni**vom**ous	OED, AHD
-vor-	1646	Latin *vorāre*	eating	carni**vor**ous	OED, AHD, W3
-vulp-	1826	Latin *vulpēs*	fox	**vulp**icide	OED, AHD
-xanth-	1823	Greek *ξανθός*	yellow	**xanth**ocarpous, crypto**xanth**in	OED, AHD, W3
-xen-	1844	Greek *ξένος*	foreign	**xen**olite, lipo**xen**ous	OED, AHD, W3

Quasi-Lexeme	Date	Origin	Meaning	Examples	Sources
-xer-	1656	Greek *ξηρός*	dry	**xer**ophagy	OED, AHD, W3
-xiph-	1835	Greek *ξίφος*	xiphoid cartilage	**xiph**isternal, **xiph**opagus	OED, AHD, W3
-xyl-	1656	Greek *ξύλον*	wood	**xyl**ophagous, litho**xyl**	OED, AHD, W3
-ze-	1777	Greek *ζειν*	boiling	**ze**olite	OED, AHD
-zo-	1661	Greek *ζῷον*	animal	**zo**osophy, phanero**zo**ic	OED, AHD, W3
-zon-	1872	Greek *ζώνη*	belt, girdle	**zon**ochlorite	OED, AHD, W3
-zyg-	1828	Greek *ζυγόν*	joining, yoking	**zyg**odactylous, crypto**zyg**ous	OED, AHD, W3
-zym-, -zymos-	1704	Greek *ζύμη*	ferment, leaven	**zym**urgy, histo**zym**e, **zymos**imeter	OED, AHD, W3

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ENDNOTES

[1] The term 'Greek' is obviously referring to 'ancient Greek'.
[2] This excerpt is from 'Quaestiones in Heptateuchum', Book II, section 80, which was written between 419 and 420.
[3] There is a distinction to be made between lexical categories (e.g. noun, verb, adjective, etc.) and morphemic categories (e.g. affix, lexeme, etc.).
[4] For reference, a glossary of quasi-lexemes complements the analytical section of this dissertation.
[5] The original quote is: 'Nous apppelons lexème […] l'entité linguistique qui sert de base aux RCL'.
[6] This is contradicted by examples like nano- and pico-, which according to Tournier (1991) where adopted in 1947 at the 14th Conference of the International Union of Chemists.
[7] From a diachronic perspective, grammaticalization is a process whereby a word loses its lexical status in favor of a functional status. The opposite phenomenon is called lexicalization, which means both turning a grammatical morpheme into a lexical morpheme and listing that lexical morpheme in the dictionary, although the second meaning pertains more to the lexicographical tradition.
[8] I refer to an affix as being terminal when it ends the derivational chain, or in other words, when it does not allow further derivation.
[9] It may be argued that the prefix -par- in 'paraesthesia' has been morphologically and semantically unified to the quasi-lexeme -aesthes- to the extent that 'paraesthesia' is no longer perceived as a prefixed quasi-lexeme. This would justify the unusual position of the prefix in 'acro**par**aesthesia'.
[10] With Greek constituents, the interfix -o- may sometimes be substituted with the interfix -a- (e.g. gene**a**logy), -e- (e.g. tel**e**pathy), or -y- (e.g. tach**y**cardy). With Latin constituents, the interfix -i- may sometimes be substituted with the interfix -a- (e.g. 'aqu**a**naut'), -o- (e.g. ment**o**labial), or -u- (e.g. 'quadr**u**manous'). Once again, the position I have adopted is that the choice of the interfix -a-, -e-, -i-, -o-, -u-, or -y- may have been influenced in one way or another by the morphology of the genitive case in Greek or Latin for each left-hand constituent of a composite, yet it is not etymologically justified as being an intrinsic part of that constituent.
[11] This paleo-lexeme has only one known prefixal derivation: **re**fute. The lexeme 'confute' is a case of blend: con- +[re]fute > confute.
[12] From Latin *parāre*, which means 'to make ready'. It has to be distinguished with the paleo-lexeme -par- from Latin *parēre* 'to appear' (cf. second conjugation).
[13] From Latin *spectāre,* which means 'to look', frequentative of third conjugation *spectere*.
[14] From Latin *saltāre*, which means 'to leap', frequentative of fourth conjugation *salīre.*

[15] In terms of morphemics, Gabriele Stein (1977) points out that 'cases like conceive, deceive, receive have been repeatedly discussed in morphology and scholars disagree as to whether to regard these as monomorphemic or bimorphemic' (p.143). In light of my analaysis, the answer I would give is that they are considered affixed lexical units and, therefore, bimorphemic units if we look at them from a diachronic perspective. However, from a strictly contemporary synchronic perspective, paleo-lexemes and their prefixes have merged into monomorphemic units and have become inseparable elements.

[16] Suffixes with no left-hand hyphen are terminal suffixes when bound to the paleo-lexeme -ject-. The list is not meant to be exhaustive, but to give an idea of the manifold possibilities of suffixal derivation.

[17] The disyllabic paleo-lexemes are usually formed from alternate Latin stems such as a nominal case (e.g. -manat- in 'e**manat**ion' from *emanatio*) or a supine (e.g. -hibit- in 'exhibitive' from *exhibitum*). The bottom line is that both have present infinitive forms *emanāre* (1st conjugation) and *exhibēre* (2nd conjugation), from which other Romanic languages like French will derive monosyllabic paleo-lexemes (e.g. -man- and -hib- in the verbs *émaner* and *exhiber* respectively).

[18] There is a verb 'affricate' (1891), which is back-derived from the noun 'affrication' (1706).

[19] The position I take is that composites with quasi-lexemes are bound to have an English suffix in order to form a complete lexeme, unless they keep their original Greek or Latin case inflection for the purpose of scientific nomenclature. The lexeme 'helicopter' is a French loanword, and it is likely that a graphic assimilation should have occurred to respect the phonic analogy between the two languages. Nonetheless, I will represent 'helicopter' with a zero-suffix in order to corroborate the law of affix requirement developed in Part I. C.

[20] Both fracto-lexemes and elements of blends were part of a source lexeme at first.

[21] Beatrice Warren (1990) talks about secretion as a 'process in which certain semantic elements in a linguistic unit are kept and others discarded' (p.119).

[22] My perspective is that a blend is a variety of compound that is telescoped or superimposed rather than juxtaposed.

[23] I will confidently assert that infixation is a process that is used to connect bound lexemes that are juxtaposed. Blends are not juxtaposed. They are either telescoped or superimposed.

[24] I would say that the metasemous transfer is from 'word' to 'science'. The quasi-lexeme -log- in 'psychology' refers to the discipline rather than to the person. The agentive suffix -ist would better render the meaning of 'specialist'.

[25] This composite with quasi-lexemes was coined by the Vicomte Gustave de Ponton d'Amécourt in 1861.

[26] I will challenge this standpoint in Part III. A.

[27] A large number of composites that French borrowed from classical languages had their vernacular counterpart already established in the French lexicon. Cottez gives the example of 'nécromancie', which came to be in competition with the vernacular 'nigromance' until the latter was eventually rejected.

[28] However, in modern English, these suffixes have become somewhat obsolete and tend to be substituted with suffixes like -er, -ist, and -ian, which have long been naturalized in English.
[29] This excerpt is from 'Bald's Leechbook', London, British Library, Royal 12, D. xvii, a medical handbook probably written around the tenth century.
[30] Hans Marchand (1969) speaks of neoclassical compounding as a word formation process on the basis of Neo-Latin, since 'Neo-Latin comprises [Latin and] Greek patterns as well' (p.7).
[31] His editor in chief ought to buy him a 'glossoplasty'.
[32] The neoclassical compound 'schizophrenia' was produced in German before being borrowed by English.
[33] Incidentally, this constituent order is occasionally violated, as the example 'onager' shows (from the Greek *ὄνος* 'ass' and *ἄγριος* 'wild').
[34] I intentionally leave aside Robert Lees's (1960) theory of transformational analysis, which does not seem to work when metasemous phenomena come into play, as it is often the case within compounding. Allen (1978) points it out by saying that '[…] although Lees can conceivably derive cart-wheel from wheel of a cart, his analysis has no bearing on the word cartwheel which refers to an acrobatic stunt' (p.90).
[35] Although the concept of 'underlying sentence' or 'kernel sentence' is borrowed from Lees, who used it in the framework of his transformational theory, in Marchand's own analysis, it is meant to gloss a derived or compound lexical unit as an active and unnegated clausal structure.
[36] In contrast with the lexicality of a complex structure, an elementary structure, which I represent between slashes, consists in dissecting a syntagma into its irreducible morphemic units in order to highlight their semioticity.
[37] It is preceded by 'therapeutic' (1541) and succeeded by 'therapist' (1886).
[38] Although I have advocated one entry form for each quasi-lexeme no matter what its position in a compound is, I must admit that there are quasi-lexemes whose morphology have been altered and require an allomorphic entry form. Thus, -bi- from Greek *βίος* is reduced to the phoneme -b- in 'microbe'.
[39] Rather than being a haplological formation, I would say that 'diplophobia' must have undergone a paronymic attraction with 'diplophonia'.
[40] In this regard, Bauer (1983) makes a sharp distinction between productivity, which 'concerns rule-governed processes', and creativity, which is an 'unpredictable, non-rule-governed way of forming new lexemes' (p.63).
[41] Incidentally, Tournier (1991) rightfully refers to this compound as being alexical. The quasi-lexeme -dont- does not exist. There is a quasi-lexeme -dent- of Latin origin and a quasi-lexeme -odont- of Greek origin, which both mean 'tooth'. The quasi-lexeme -stomat- from Greek *στόμα, στόματος* 'mouth' would have been more accurate. Also, since the quasi-lexemes -stomat- and -log- are of Greek origin, rather than resorting to -ped-, which is of Latin origin, the quasi-lexeme -pod- from Greek *πούς, ποδός* would have fit more appropriately.

[42] Reduction does not occur at the level of the elementary structure, since simple semiotic units never stem from compound semiotic units.
[43] Notice that this is not valid for compound adjectives (e.g. bottle-green, lemon-yellow, sky-blue, etc.).
[44] Compounding and derivation describe processes. Compounds and derivatives describe the results of these respective processes. Therefore, a compound is a lexeme that has undergone compounding, and a derivative is a lexeme that has undergone derivation.
[45] Although the lexicalized formation is 'dentirost**er**', the last two phonemes have undergone metathesis as a result of a paronymous attraction with the vernacular derivative 'rooster'. For the purpose of our analysis of the elementary structure, I will restitute the semiotic unit /-rostr-/, which, concatenated with the semiotic unit /-dent-/, serves as the basis for other formations like 'denti**rostr**al' and 'denti**rostr**ate'.
[46] Amiot and Dal's concept of exponents of LCRs (exponents of 'Lexeme Construction Rules') is explained in Part I. A.
[47] Synthetic compounds whose deverbal constituents are left-handed have a split head. For example, the representation of an elementary structure like 'misogynist' would be: /-mis- + -ist-/ is the head of the compound /-mis- + -gyn- + -ist-/.
[48] Incidentally, as I already pointed out, these complex derivatives systematically undergo a metonymy, whereby the genus or the species is expressed by its characteristics. Hence, we do not assert that the mammal **has** 'pachyderm' or that the worm **has** 'oligochaete' but that it **is** a 'pachyderm' or that it **is** an 'oligochaete'. I will develop the issue of metasemous transfer in Part III. C.
[49] Most of the complex derivatives are either classical formations borrowed from Greek or Latin through French, or they are neoclassical formations produced in French. My hypothesis is that these derivatives typically end with the morpheme -e in French, because they aim at conforming to the morphology of vernacular nominal formations. Once they enter the English lexicon, the morpheme -e is either retained (e.g. leptodactyl**e**) or dropped (e.g. tetrapod**ø**) based on morphophonological rules of assimilation.
[50] I will explain the primal and subsequent stages of complex derivation in Part III. C.
[51] The fact that a compound *stricto sensu* has an established referent does not mean that it is univocal when out of context. Therefore, it is clear that the level of relational ambiguity between the constituents is not what differentiates a compound *stricto sensu* from a fortuitous collocation. Their respective identities are solely based on whether they are integrated in the lexicon or not. As I pointed out earlier, the decisive factor that increases relational ambiguity is the transposition of a modifier from adjective to noun.
[52] The dominance implies that, hierarchically, there are meanings that prove more likely than others.
[53] The modifier may be a transposed noun as in '**lith**ophyte' or '**copr**olith'.
[54] Warren disagrees with Elizabeth Selkirk (1982) who, in line with Otto Jespersen (1942), asserts that a 'general characterization of the relation is probably impossible and it would seem that virtually any relation between head and non-head is possible – within pragmatic limits, of course' (p.23).
[55] Metasemy stems from Greek *μετά* 'after' (and by extension 'change') and *σῆμα* 'meaning'.

[56] A few historians have also argued in favor of a misinterpretation of Latin *malus*, which both means 'evil' and 'apple'.
[57] In this case, the semiotic unit /-erythr-/ would become synonymous with /-ereuth-/, from Greek *ἐρεύθειν,* which means both 'to blush' or 'to cause to blush'.
[58] I borrow the term 'association of ideas' from Tournier (1985).
[59] The syntagma /-phall- + -crat-/ further displays a shift in application from the 'government on man' to the 'government by man'.
[60] As a matter of fact, for the sake of physical resemblance, the semiotic unit /-hy-/, from Greek *ὗς, ὑός* 'swine', would have been a better vehicle for the metaphor. Therefore, rather than studying the physical resemblance, I argue that the question of prototypicality, according to which every single category has a representative that is more salient than others, may be playing an important part in selecting the 'horse' rather than any other mammal to be the vehicle of the metaphor.
[61] I refer to the ground as a 'complement' rather than as a modifier, because it is a morphological component that, in the case of a complex derivative, is necessary to complete the metaphor.
[62] Lexical elements are no less than lexical units that form a part in a syntagma. For example, 'physiology' is a compound lexical unit that becomes a compound lexical element in 'psychophysiology'.
[63] I have intentionally left aside the minor case of dvandvas, which I will nonetheless subject to Lieber's principle of co-indexation in Part IV. C.
[64] The nominal constituent *λίθος* 'stone' may be interpreted as an indirect internal argument comparable to a prepositional phrase, and the compound 'lithoglyph', out of context, may be glossed as 'he carves **with** stones' or 'he carves **on** stones (as a support)'.
[65] Individuality is understood as 'singleness', as opposed to specificity, which is understood as 'definiteness'.
[66] I am talking of a 'semantic co-reference', regardless of the possible gap in the syntactic structure.
[67] Incidentally, we may apply the same principle of collective versus individual interpretations to the vernacular syntagma 'booklover':

> *Paul is a book[i]lover. He claims they[i] are more interesting than movies.*
> *Paul is a [booklover][i]. He claims it[i] is more interesting than movies (unless 'book' has a specificity).*

[68] For a first constituent to be non-referential in interpretation means that it is not used for the sake of its own specification. In that respect, most syntagmas in 'berry', in which the first constituent is a noun, do not follow the traditional pattern of compounding, since this first constituent has either an opaque specification (e.g. 'goose' in 'gooseberry') or it has no specification of its own (e.g. 'cran' in 'cranberry').
[69] In syntactic terms, to receive an argument interpretation means to be realized inside the maximal projection of a verb.
[70] In these tree structures, I presuppose that the head of the compound is indeed the right-hand constituent.

[71] The significance of Lieber's theory is that once we have defined which is the 'intuitively more plausible word structure for synthetic compound' (p.48), there is no need for a transformational or movement analysis. Instead, a framework of lexical representation, with the addition of a principle of coindexation, should suffice to explain any compound interpretation.
[72] The weakness of Lieber's framework of lexical semantic representation is that it does not provide a more specific procedure of how comparing the skeletons of each constituent may lead the interpreter to a clear interpretation of a compound.
[73] Although 'hippocamp' is not an endocentric compound (since Z is not a hyponym of Y), I will still look at $(X + Y)_{qualifier}$ as having an endocentric structure. Lieber herself asserts that exocentric compounds may be tested as endocentric primary compounds.
[74] When only one argument is available, it is referred to as the 'referential argument'.
[75] Marchand himself argues that the 'lexical independence of the second argument is a matter of secondary importance' (p.17). For instance, a synthetic compound may consist of a head constituent that is an independent lexical unit (e.g. deer **hunter**, psycho**therapist**, etc.) or a head constituent that is a functional derivative (e.g. watch **maker**, anthropo**phagist**, etc.).
[76] There may be a morphosyntactic impediment to the deverbal constituent /-mis-/ being right-handed. However, based on the fact that its antonym /-phil-/ produces synthetic compounds that have the potential to occur initially (e.g. **phil**anthropist) or finally (e.g. biblio**phil**ist) in a pattern of complementary distribution, I would argue that /-mis-/ should logically receive the same privilege.
[77] The term 'paradigma' comes from Greek *παραδεικνύναι* 'to show side by side'.
[78] I would even postulate that this paradigma of synthetic compounds with quasi-lexemes is meant to be the same across languages. The example of 'schizophrene' (from Greek *σχίζειν* 'to split' and *φρήν* 'mind'), which was initially produced in German, is no exception, although the underlying sentence bears witness of passivization (we may gloss the syntagma as 'the mind is split' rather than 'he splits the mind'). Lieber confesses that in such cases of passivization, with the highest argument of the verb being eliminated, she is 'not exactly sure how to represent this in lexical semantic terms' (p.57).
[79] Since the agentive suffix /-er/ partakes of the argument structure of the syntagma, it cannot possibly occur in primary compounds or in complex derivatives. Therefore, the primary compound 'onager' cannot possibly have a split head divided as /-on- + -er/. In this example, borrowed from French *onagre*, the last two phonemes have undergone metathesis; therefore, the compound 'onager' can be explained as follows: /-on-/ is the head, /-agr-/ is the modifier and /-e/ is a suffix that merely indicates the lexical category of the syntagma.
[80] I leave aside minor agentive suffixes like /-ant/ (e.g. funambulant), which have become obsolete or like /-aster/ (e.g. astrologaster), which are infused with prejudiced connotations.
[81] Although its external argument is not a quasi-lexeme, the hybrid compound 'Russophilø', which may be glossed as 'he loves the Russians', fits nicely in the paradigma.

[82] Incidentally, of all these agentive suffixes, /-ist-/ is the only one to be restricted to the function of agent.
[83] Leonhard Lipka (2002) exemplifies this point with the vernacular simple derivative 'novelist'. He argues that we may start with the underlying sentence 'someone writes novels' or introduce what Lees calls a 'generalized verb', such as 'someone makes novels' or 'someone produces novels'. In either case, the suffix /-ist/ will always be the subject in the underlying sentence.
[84] Notice that the syntagma 'pachydermia' defined as an 'abnormal physical condition whereby the skin hardens' has not undergone a metonymical transfer but only a suffixal derivation.
[85] A metaphorical transfer is required when /-andr- + -gyn-/ is applied to the vegetable kingdom.
[86] It is useful only to a certain extent. For instance, it does not allow the interpreter to differentiate between a dvandva that blends the two constituents into one and a dvandva that divides into constituents the two functions of the thing or person expressed by the compound.

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